THE RUBBER AGE

ESTABLISHED 1917

COVERS ALL PHASES OF THE PRODUCTION AND MARKETING OF CRUDE RUBBER AND THE MANUFACTURE AND DISTRIBUTION OF RUBBER GOODS

Vol. 38 DECEMBER, 1935 No. 3

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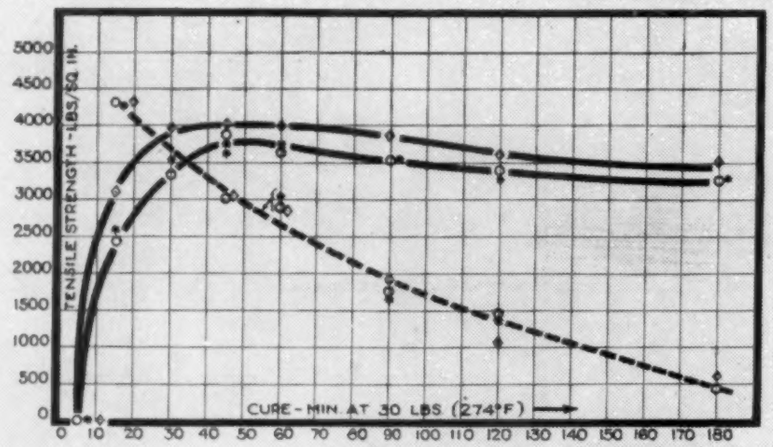

		Particle Size μ	PbO %	Acidity as SO_3
"FAST" CURING	✱ -XX RED-103 ZINC OXIDE	0.12	0.10	0.04
	◈ -XX RED-110 ZINC OXIDE	0.12	0.75	0.04
"SLOW" CURING—	O -XX RED-4 ZINC OXIDE	0.35	0.30	0.25

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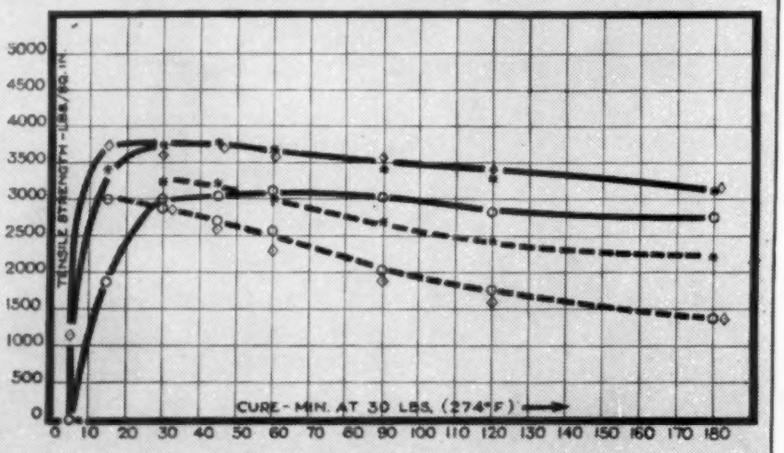

No. 45

of a series of charts showing a comparison of "FAST" and "SLOW" curing zinc oxides with typical accelerators

New Jersey Zinc

With 10 parts of zinc oxide there are practically no differences in the curing rates of **XX Red 103** and **XX Red 4.** • **XX Red 110** appears to be somewhat more active due probably to its free PbO content. • With 100 parts of zinc oxide, there are further indications of the greater activity of **XX Red 110.** In the early cures **XX Red 4** exhibits its characteristic retardation.

UNIFORM QUALITY ZINC OXIDES

THE NEW JERSEY ZINC COMPANY

THE RUBBER AGE

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Vol. 38 DECEMBER, 1935 No. 3

Progress of Chlorinated Rubber

A Review of Several Manufacturing Processes Adopted in the Past Few Years Together with Descriptions of Improved Characteristics

By George C. Clark

ALTHOUGH the knowledge of chlorinated rubber is about eighty years old, it was not until the last few years that proper attention was paid to it. Because of its peculiar characteristics it was natural that the material found ready application as a paint base, but there are many other uses to which chlorinated rubber has been put, although many of these latter uses are still very much in the experimental stage.

Among these latter uses we include the following:—the tips of cigarette paper are being impregnated with chlorinated rubber, dissolved in a proper solvent, making the tip tasteless, odorless, incombustible and moisture-proof; partial or complete penetration of photographic printing papers and cloths for blue-print usage makes them oil-proof; impregnation with wax mixtures, such as a chloro-naphthalene and a chlorinated rubber lacquer plasticized with the proper substance, fire-proofs and water-proofs wool, cotton, silk, paper, wood, and other organic fibrous materials. These are some; there are many others.

Early efforts on chlorinated rubber were directed toward the finding of a substitute for the ordinary process of vulcanizing rubber with sulfur. Early results were disappointing because of the totally different characters between chlorinated and vulcanized rubber. In 1859 Englehard and Day took out an English patent describing the reaction between chlorine and rubber[1]. In 1888 Gladstone and Hibbert produced an advanced type of chlorinated rubber by chlorination of crepe rubber dissolved in chloroform which contained many of the characteristics of the present day Tornesit.[2] Later, St. J. Peachey prepared a number of varnish and celluloid-like substances which were respectively termed "Duroprene" and "Caoutchouc Glass." Peachey's method[3] was somewhat similar to earlier methods, namely, thin strips of rubber were exposed to the action of chlorine vapors while hanging in a chlorinator until they turned soft and sticky when they were dissolved and the chlorinated rubber precipitated with alcohol.

In Germany, Lamble first recommended chlorinated rubber in the production of rust-preventive paints, but the product produced proved to be very unstable. This unstability, however, has since been found to be due to too low a chlorine content. Other names are also associated with the progress of chlorinated rubber: Ellis, Edison, Bradley—but few of these are associated with actual commercial processes.

There are several theoretical principles of rubber chlorination. Those advanced by Nielsen, Bloomfield and Farmer, and Kirchhof have received major consideration. The Nielsen theory has been clearly defined.[4] Bloomfield and Farmer concerned themselves with chlorination by treatment with hypochlorous acid. Kirchhof is of the belief that the process proceeds stepwise from isoprene, as follows:[5]

$$(-CH_2-CH=C(CH_3)-CH_2-)_x+(Cl_2)_x=$$
$$(-CH_2-CHCl-C(CH_3)Cl-CH_2)_x$$

One and two molecules of hydrochloric acid are then split off giving the following compounds:

$$(-CH=CH-C(CH_3)Cl-CH_2-)_x$$
$$(-CH=CH-C(CH_3)=CH-)_x$$

This is followed by the addition of chlorine to the double bonds to form trichloro and tetrachloro derivatives:

[1] THE RUBBER AGE (N.Y.), Dec. 10, 1933.
[2] Hercules Powder Co.
[3] D.P. 329,293.
[4] Kautschuk, 1933, 9, 11, 167.
[5] Tornesit, Hercules Powder Co. booklet.

$$(—CHCl—CHCl—C(CH_3)Cl—CH_2—)_x$$
$$(—CHCl—CHCl—C(CH_3)Cl—CHI—)_x$$

It was in 1930 that anti-corrosion chlorinated rubber paints giving good results were first produced in Germany by the Mannesmann Tube Works. It was also about this year that Nielsen brought out a process for passing chlorine into a hot solution of raw rubber in carbon tetrachloride. In the next few years a number of chlorinated rubber materials made their appearance in Germany. However, in 1933, Dr. Krumbhaar delivered a lecture on "No Illusions About Chlorinated Rubber" during the Paint Research Station Exhibition (at Teddington, England) in which he severely criticized a number of claimed properties of the existing chlorinated rubbers, and it may be aptly stated that due in some part to this lecture of criticism many of the previous causes of dissatisfaction have been eliminated from the chlorinated rubbers of the last two and three years.

To some extent current practices in the manufacture of chlorinated rubbers follow those originally set down by Engelhard and Day, Havemann, St. Peachey, and other early patentees. It has been determined, however, that the chlorine-treated vulcanized rubbers are more suitable for molding purposes than for paint materials. The illustration, and description, indicate one current method of manufacture. It is taken from the patent of Beckmann, Nielsen and Deseniss (U. S. Patent 1,918,370).

A recent method for producing chlorinated rubber products of claimed improved stability involves precipitating solid chlorinated rubber from solutions thereof by addition of methyl alcohol, separating the precipitated solid and bringing it into intimate contact with a further quantity of methyl alcohol.[6] In this method the precipitated solid may be redissolved and reprecipitated by methyl alcohol one or more times prior to the final washing with methyl alcohol. For example, a solution of rubber in carbon tetrachloride is chlorinated, the resulting solution is treated with a basic substance such as soda ash and filtered to remove solid matter, solid chlorinated rubber then being separated from the solution as detailed. Films of chlorinated rubber may be obtained by evaporation of solutions of the chlorinated rubber obtained as described in solvents such as benzene in which is incorporated a plasticizing agent, namely, up to 33 per cent dibutyl phthalate of the weight of the chlorinated rubber.

Adhesion of Chlorinated Rubber Films

In earlier experiments it was discovered that adhesion of chlorinated rubber films upon pure aluminum or its alloys is destroyed in time owing to liberation of chlorine and hydrochloric acid. A recent patent[7] now claims that preliminary oxidation of the metal surface overcomes this drawback. Oxidation of the aluminum can be effected by chemical methods or by electrolysis.

The method sponsored by the Imperial Chemical Industries is also finding favor. This method[8] is based on a solution of raw rubber in carbon tetrachloride being fed into boiling water at the rate of approximately 50 litres an hour through a one inch pipe about 20 inches below the surface; the water is well agitated and its temperature maintained by steam injection; the chlorinated rubber rises to the surface in a porous, spongy, or fibrous condition, all the solvent being evaporated before the surface is reached, the solvent being recovered. Since water is slightly alkaline any hydrochloric acid dissolves in it. To obtain a ready plasticized chlorinated rubber, plasticizers may be dissolved with the raw rubber in this method.

[6] E.P. 433,196.
[7] E.P. 433,367.
[8] B.P. 402,454.

Remarkable progress has been made in the stability of chlorinated rubbers. Stability is dependent almost entirely on the complete elimination of excess chlorine and water-soluble chlorides. For this reason a pure latex must be used. The average chlorine content of rubbers used in paints should be from 60 to 72 per cent. Although the chlorine content should be high, the manner and method of manufacture is much more important.

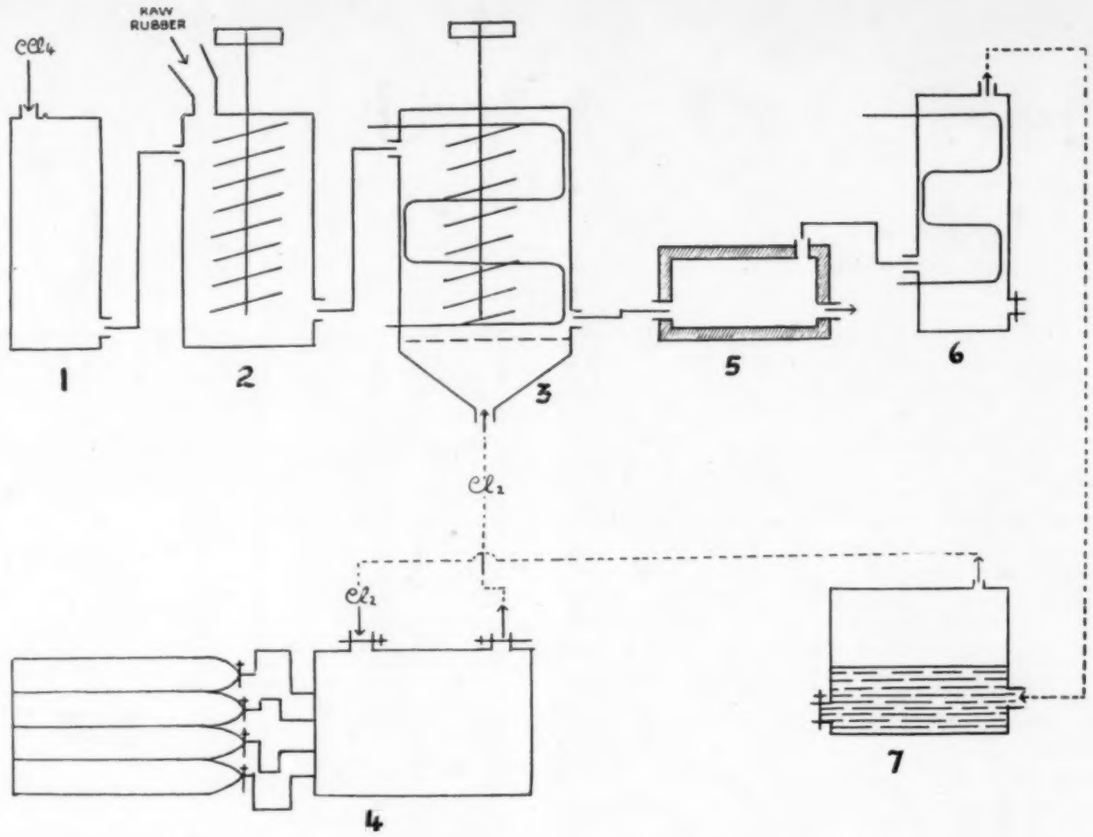
Results on Temperature Stability

In the matter of temperature stability some interesting results of tests conducted by E. Fraser Smith have come to light.[9] Mr. Fraser immersed four test tubes of different makes of chlorinated rubber in an oil bath at an initial temperature of 85°C. In each of the tubes there was inserted a piece of moistened litmus paper to indicate the presence of hydrochloric acid coming off, and a piece of filter paper moistened with potassium iodide to indicate the presence of any chlorine evolved. The bath was heated over a period of one hour to a maximum temperature of 195°C. Of the four test tubes only one showed a trace of hydrochloric acid at 130° while the other three showed it markedly. One of the tubes held its chlorine until 175°C. From these tests Fraser concludes that decomposition sets in at about 130°C., and that charring commences at about 160°C.

Another interesting experiment merits attention. In Germany three panels have been subjected to uninterrupted exposure since November, 1933. One of these has a chlorinated rubber-red lead priming coat followed by two coats of a lacquer; the second was similarly treated with the exception that the finishing lacquer contained linseed instead of wood oil; the third was treated with a white lead-red oxide oil primer and was finished with a red oxide oil top coat. The German State Railways laid down the specifications for all three paints so their quality was assured. Recent examination of all three panels revealed that the chlorinated rubber-coated panels have stood the exposure to better advantage than the third painted panel.

Before concluding, mention should be made of another new process[10] which produces a material mid-way between rubber and chlorinated rubber, or, in other words, a product that has the resilience of rubber and many of the characteristics of chlorinated rubber, such as low viscosity of solutions and chemical inertness. In this method organic hypochlorites are added to rubber in solution. The product is soluble in ordinary solvents until the solvent has been removed, when it becomes insoluble. Methyl or ethyl hypochlorite are preferred due to their greater safety in handling; for the same reason it is preferred not to isolate them from the solution in which they are prepared. The product contains about 30 per cent of chlorine and consists mainly of addition products. The process comprises preparation of a dilute solution of hypochlorous acid by any of the usual methods; shaking this solution with half its volume of an inert solvent, such as benzene, xylene, carbon tetrachloride, containing 10 per cent (or 15 per cent) of alcohol, drying the solvent layer with calcium chloride, and adding to a rubber solution; and concentrating the solution after at least 24 hours under reduced pressure at a temperature preferably not exceeding 40°C. For instance, 1890 grams of cold 5 per cent nitric acid are run onto 190 grams of cooled bleaching powder; the solution is filtered and shaken with 1000 c.c. of benzene containing 100 c.c. of alcohol; the solvent layer is removed, dried with calcium chloride and added to 300 grams of a

[9] Oil & Colour Tr. J., Oct., 25, 1935.
[10] E.P. 433,082.



Flow Line of Plant for Chlorinating Rubber Taken From U. S. Pat. 1,918,370

Description: (1) solvent supply container; (2) rubber solution container provided with an agitator to facilitate easy solution of the rubber; (3) large-capacity chlorinator fitted with an agitator, steam coils to keep the temperature about 60° F., and a perforated bottom through which the chlorine is injected; (4) vaporizer into which the liquid chlorine passes before entering the chlorinator; (5) drier into which the contents are discharged to drive off all the solvent after the reaction is completed as determined by test samples drawn at intervals from the vaporizer; (6) cooling column adapted to cool the gases to about 50° F. whereby most of the carbon tetrachloride used as solvent is condensed as a liquid and is sent back to the supply container for reuse; (7) washer containing water through which the remaining hydrogen chloride and chlorine are passed. The plant is continuous in operation.

10 per cent rubber solution. The resulting rubber-chlorinated rubber product has many uses.

In tests conducted by T. Yamato of the Imperial Industrial Research Institute of Osaka, Japan, on the subject of how much chlorine can be put into rubber, it has been determined that the properties of chlorinated rubber depend on the chlorine content but that 60 per cent or more of chlorine in the molecule produces a rubber strongly heat-resistant, acid-resistant, alkali-resistant and incombustible. In this form the chlorinated rubber makes for a useful substitute for ebonite and plastic material. In these tests chlorination was effected by passing chlorine into solutions of rubber in carbon tetrachloride or in benzene. The chlorine content increased with time but up to a maximum of 64.7 per cent chlorine, which corresponds to the empirical formula $C_{10}H_{13}C_{17}$.

Improvements in Chlorinated Rubber Paint

Although, as stated, the use of chlorinated rubbers is spreading to other products, major consideration is still being given to its use as a paint material. In this connection, however, several noted improvements have been recently brought to light. For instance, the Chemische-Technische Reichs-Anstalt has concluded tests on paints for use on walls of acetylene apparatus. Complete protection against corrosion by hot lime-water and acetylene residues was obtained by a paint containing 16 per cent chlorinated rubber, 44 per cent xylene, 35 per cent lithopone, and 5 per cent tritolylphosphate.

Detel Products, of London, has introduced Detel Red, a general purpose chlorinated rubber paint for use in the chromium plating industry. The electrolyte in chromium plating contains free sulfuric acid and, of course, considerable quantities of chromic acid, which in use is heated to 50°C. Under such conditions Detel Red is unaffected up to 16 hours' immersion and jigs protected with the chlorinated rubber paint have been used more than 30 times without paint renewal. No other type of protective paint has been found to resist the combined oxidizing and acidic attack of the chromium plating bath other than those of chlorinated rubber structure.

There are many other products of chlorinated rubber that may be cited among those contributing to the progress of this branch of industry, but the aforegoing mentions should have indicated the progress made in the last three to five years.

Rubber Figures Play Merchandising Roles

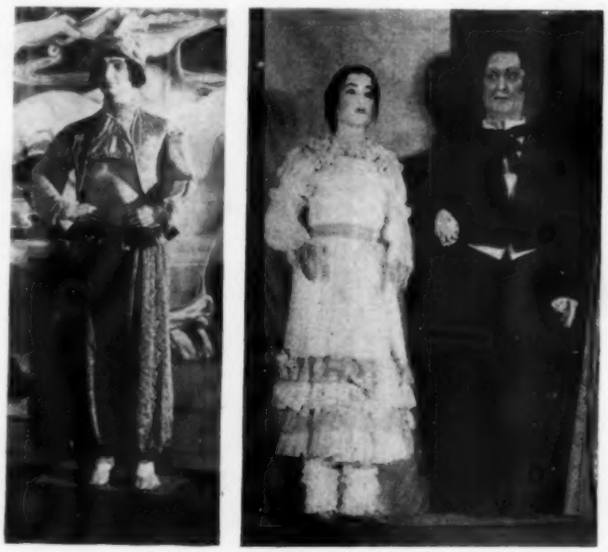
Fantastic and Historic Figures Made of Rubber Utilized by Department Stores to Stimulate Their Holiday Trade

MASSIVE rubber figures and famous circus personages and animals of yesteryear, made of rubber, clay and papier mache, were and are being featured by two of New York City's leading department stores in merchandising promotion schemes. One of these was the annual Macy Thanksgiving parade; the other is currently being featured by Gimbel Brothers.

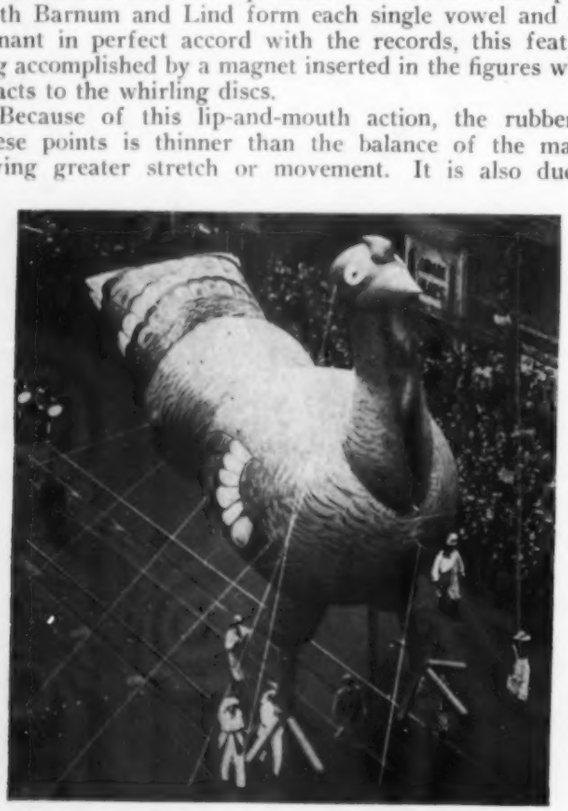
Gimbel's has reproduced to almost life-like characteristics the circus figures made famous by P. T. Barnum. Among these figures are Barnum himself; Jenny Lind, the Swedish Nightingale; Jumbo, the largest captive elephant ever brought to the United States; Tom Thumb, mightiest of midgets; the India Rubber Man; and dozens of other individuals and animals, many of which incorporate rubber in their construction.

The "circus" is fashioned after the original Barnum's Museum. One exhibit depicts Barnum introducing Miss Lind. The faces of both characters consist of rubber masks stretched tight over a papier mache framework. The masks are of sponge rubber, ¼ inch thick with the exception of ⅛ inch thickness around the lips and mouths. These characters, like all the others in the "museum," are electrically operated from a central control panel. Records are used to reproduce the voice. The lips of both Barnum and Lind form each single vowel and consonant in perfect accord with the records, this feat being accomplished by a magnet inserted in the figures which reacts to the whirling discs.

Because of this lip-and-mouth action, the rubber at these points is thinner than the balance of the masks, giving greater stretch or movement. It is also due to this movement, which naturally tears the corners of the rubber mask in time, that the masks, which are molded, must be replaced every three or four weeks. The exhibit makers find that it is more economical to replace the masks than to repair them. The lip-and-mouth action is dependent on a papier mache hinge over which the rubber is rolled.



Left: The body of this "India Rubber Man" is made of rubber. Right: Rubber masks constitute the faces of Barnum and Miss Lind.



This thirty-foot turkey, made of rubberized fabric and filled with helium gas, was one of the features of the Macy parade.

Another interesting use of rubber at this exhibit is that in connection with the India Rubber Man. The body of this figure is covered with a thin sheet of rubber molded to body proportions. From time to time the figure apparently extends his stomach by pulling the skin away from it by stretching first his right, then his left hand. This action is cleverly managed by a simple set of levers inside the body of the figure which operates on a push-pull movement. The "push movement" forces the hand, which is attached to the rubber body, outwards, thus giving the impression that the hand is engaged in a pulling motion.

Rubber plays a part in the construction of several of the pseudo animals on exhibit. Jumbo's trunk consists of a canvas covering over a framework, the canvas having been impregnated with latex. The skin of a gigantic hippo has received the same treatment, i.e., a canvas covering which has been latex impregnated. All of the animals have movement, grunt and growl, and perform other functions in keeping with actual characters. Several other figures and animals incorporate rubber in their construction, the principal use being in masks for faces.

The complete Barnum's Freaks exhibit at Gimbel Brothers was designed and prepared by the firm of Messmore and Damon, of New York City. The rubber masks

(Continued on page 150)

Studies on the Acetone Extraction of Raw Rubber

By Hidemaro Endoh

Dunlop Rubber (Far East) Company, Kobe, Japan

THE AUTHOR, one of Japan's leading chemists, has conducted a series of experiments on the acetone extraction of raw rubber as affected by heating and aging. The results of these tests were presented in the August and September, 1935, issues of the *Journal of the Society of the Rubber Industry of Japan* (Vol. 8, Nos. 8 and 9). The following article has been abstracted by the author from his original papers published in Japanese and represents already established results on the subject although further experimentation is being conducted. —EDITOR.

I. The Effect of the Time of Heating of the Alcohol Solution on the Determination of the Acid Value of Raw Rubber and its Acetone Extract.

The free fatty acids of the acetone extract of raw rubber were studied by G. S. Whitby (*Journ. Soc. Chem. Ind.*, 1923, **42**, 336; *Ind. Rub. Journ.*, 1925, **90**, 382), Bedford & Winkelmann (*Ind. Eng. Chem.*, 1923, **16**, 32), P. Dekker (*Ind. Rub. Journ.*, 1925, **70**, 815), Van Rossem & P. Dekker (*Ind. Eng. Chem.*, 1926, **18**, 1152), G. Bruni & T. G. Levi (*C. A.*, 1926, **20**, 309), and B. Bysow (*Ind. Rub. Journ.*, 1926, **71**, 99).

In order to study the change of the free fatty acids during acetone extraction, some conditions necessary for the satisfactory determination of acid value were studied in the present paper. Pale crepe from one shipment was taken and it was cut into a considerable number of pieces of rectangular shapes (about 4 cm wide and about 8 cm long). The weight of one sheet was about 1.6 to 2.0 grams. These sheets were stored in a stoppered bottle made of brown colored glass and filled with nitrogen.

(A) In the first experiment, one sample piece of the rubber mentioned above was placed in a flask, 50 cc of ethyl alcohol added and the flask heated on a water bath. After heating the flask for a definite time, the acid was titrated with $N/10$ KOH solution using phenolphthalein as indicator. The number of milligrams of KOH necessary to neutralize the free acids present in 1 gram of raw rubber is taken as acid value of raw rubber and is entered as Acid Value (R).

Sample (g)	*Time of heating (m)*	*Acid value* (R)
1.7269	10	2.60
1.6760	20	3.01
1.7834	30	2.98
1.6432	40	3.06
1.5828	50	2.83
1.6224	60	2.93

The acid value (R) increased with increasing time of heating, reaching a maximum between 20 minutes and 40 minutes, while after 40 minutes it decreased.

(B) In the second experiment, 5 sheets of the pale crepe sample previously mentioned were taken and extracted with acetone for 8 hours. The acetone extract obtained was poured into a measuring flask of 250 cc capacity, and acetone was then added up to the mark. Four lots of 50 cc of the acetone solution were pipetted out into weighed flasks, the acetone evaporated off and the flask dried and weighed. Fifty cc of ethyl alcohol was added to the acetone extract thus obtained and the flask heated on a water bath. The alcohol solution was then titrated with $N/10$ KOH solution, using phenolphthalein as indicator. The number of milligrams of KOH necessary to neutralize the free acids contained in 1 gram of acetone extract is taken as the acid value for the acetone extract and is entered as Acid Value (A).

Sample 8.5632 g (5 sheets)

Acetone extract (g)	*Acetone extract (%)*	*Time of heating (m) Acetone extract dissolved on water bath (3 m)*	*Acid value (A)*	*Acid value (R)*
0.0624	3.65		98.7	3.60
0.0592	3.46	15	104.1	3.60
0.0592	3.46	30	104.1	3.60
0.0586	3.42	60	100.3	3.44

Acid Value (A) was found to be low for the acetone extract not heated and high for the acetone extract heated for 15 to 30 minutes, and it decreased with 60 minutes of heating.

The above two experiments for the determination of acid value may be summarized as follows:—

(1) For raw rubber: The sample is put into 50 cc of ethyl alcohol and heated on a water bath for 30 minutes and then titrated with $N/10$ KOH using phenolphthalein as indicator.

(2) For the acetone extract: Fifty cc of ethyl alcohol is added to the flask containing the acetone extract and the flask is heated for 15 minutes on a water bath, after which the solution is titrated with $N/10$ KOH solution using phenolphthalein as indicator.

II. The Influence of Heating at 100°C and Storing of the Acetone Extract on Acid Value.

(A) The relation between the time of heating the acetone extract at 100°C and acid value.

In the present experiment the acetone extract was dried in a steam oven, and the relation between the time of heating the acetone extract at 100° C and acid value was studied. Five sheets of the pale crepe sample were extracted with acetone for definite times, viz., 8, 16 and 24 hours respectively. The acetone extract thus obtained was poured into a measuring flask of 250 cc capacity, and acetone added to the mark. Four lots of 50 cc of acetone solution were pipetted into weighed flasks, the acetone evaporated off and the flasks, after drying for 3 minutes in a steam oven, were cooled and weighed. The flasks were then heated in a steam oven for varying times, viz., 15, 30, 60 and 120 minutes, cooled and weighed. Acid value was then determined.

(a) Acetone extract obtained from 8-hour continuous extraction

Sample 8.6000 g (5 sheets)

Acetone extract (g) A_o	0.0562	0.0556	0.0636	0.0610
Acetone extract (%)	3.27	3.23	3.87	3.54
Time of heating (m)	15	30	60	120
Acetone extract after heating (g) A_T	0.0564	0.0558	0.0634	0.0585
Acetone extract after heating (%)	3.28	3.25	3.69	3.40
$N/10$ KOH (cc)	1.05	1.0	1.05	1.0
Acid value (A)	104.7	100.7	92.5	91.8
Acid value (AT)	104.2	100.3	92.7	95.7
A_T/A_o (%)	100.36	100.36	99.53	95.91
Acid value (R)	3.42	3.26	3.42	3.26

(b) Acetone extract obtained from 16-hour continuous extraction

Sample 9.1006 g (5 sheets)

Acetone extract (g) A_o	0.0610	0.0638	0.0616	0.0600
Acetone extract (%)	3.35	3.52	3.38	3.30
Time of heating (m)	15	30	60	120
Acetone extract after heating (g) A_T	0.0622	0.0652	0.0610	0.0600
Acetone extract after heating (%)	3.42	3.58	3.35	3.30
$N/10$ KOH (cc)	1.1	1.15	1.1	1.1
Acid value (A)	101.0	101.0	100.0	102.7
Acid value (AT)	99.6	99.0	101.0	102.7
A_T/A_o (%)	101.97	102.12	99.03	100.00
Acid value (R)	3.39	3.54	3.39	3.39

(c) Acetone extract obtained from 24-hour continuous extraction.

Sample 9.1186 g (5 sheets)

Acetone extract (g) A_o	0.0612	0.0640	0.0622	0.0638
Acetone extract (%)	3.35	3.51	3.41	3.50
Time of heating (m)	15	30	60	120
Acetone extract after heating (g) A_T	0.0620	0.0644	0.0622	0.0628
Acetone extract after heating (%)	3.40	3.50	3.38	3.45
Color of acetone extract after heating	Pale yellow	Pale yellow	Pale brown	Brown
$N/10$ KOH (cc)	1.1	1.1	1.05	1.05
Acid value (A)	100.7	96.3	94.5	92.2
Acid value (AT)	99.3	95.7	95.5	93.6
A_T/A_o (%)	101.31	100.63	100.00	98.45
Acid value (R)	3.339	3.39	3.23	3.23

Acid value which is expressed relative to the acetone extract after heating is entered as acid value (AT). This value (AT) decreased gradually for the 8-hour acetone extract, showing almost no change for the 16-hour acetone extract, and decreased gradually for the 24-hour extract. Generally speaking, the acetone extract had a tendency to increase in weight, possibly owing to oxidation, and it then decreased owing to partial evaporation of the acids.

(B) The relation between storage of the acetone extract and acid value.

(a) Storing of the acetone extract in a desiccator.—Flasks containing acetone extract from 8-hour continuous extraction were kept in a $CaCl_2$-filled desiccator at room temperatures (not in the dark) and the acid value determined after 1, 2 and 3 days.

Sample 7.9200 g (5 sheets)

Acetone extract (g)	0.0471	0.0521	0.0460	0.0486
Acetone extract (%)	2.97	3.29	2.91	3.06
Days extract stored	0	1	3	5
Odor of acetone extract	No change	Slightly foul odor	Aged foul odor	Aged foul odor
Acetone extract after storing (g)	0.0471	0.0521	0.0530	0.0466
Acetone extract after storing (%)	2.97	3.29	3.34	2.94
$N/10$ KOH (cc)	0.9	0.95	0.9	0.75
Acid value (A)	107.0	102.1	109.5	86.4
Acid value (AT)	107.0	102.1	95.1	90.1
A_T/A_o (%)	100.0	100.0	114.8	96.1
Acid value (R)	3.18	3.36	3.18	2.65

A part of the acids was volatilized after 1 day and subsequently acids then formed possibly owing to oxidation. Later a further amount of the acids was volatilized.

(b) Storage of the acetone solution of the extract.—Four stoppered flasks, each containing 50 cc of the acetone solution of the extract, were stored in a dark place at room temperatures. After storing, the acetone was evaporated, the flasks dried and weighed, and acid value determined.

Sample 8.1926 g (5 sheets)

Days extract stored	0	1	3	5
Acetone extract after storing (g)	0.0515	0.0562	0.0540	0.0480
Acetone extract after storing (%)	3.15	3.43	3.30	2.93
$N/10$ KOH (cc)	0.95	1.0	0.95	0.8
Acid value (A)	103.3	108.8	103.3	87.0
Acid value (AT)	103.3	99.7	98.5	92.2
A_T/A_o (%)	100.0	108.9	104.8	93.1
Acid value (R)	3.25	3.41	3.37	2.74

The acetone extract increased in weight after 1 day's storing, possibly owing to the oxidation, but after this it decreased. Acid value expressed relative to the acetone extract after storing is written as acid value (AT). This value (AT) decreased with time of storage.

From the results obtained in the above mentioned experiments, the conditions to be followed for the determination of acid value are as follows:—Acetone is evaporated from the acetone extract soon after completion of the extraction and dried for less than 15 minutes in a steam oven, after which the extract is cooled and weighed. Fifty cc of ethyl alcohol is then added, the flask heated on a water bath for 15 minutes and the acid is then titrated by $N/10$ KOH solution using phenolphthalein as indicator.

III. Effect of the Time of Acetone Extraction of Raw Rubber on the Acid Value of the Acetone Extract and of the Acetone Extracted Residue.

In order to extract rubber for long periods, say 16 hours, the extraction may be carried out according to one of the following types:

(1) The time of extraction is divided into 8 hours. That is to say, the extraction is carried out for 8 hours in the day-time and re-started in the morning of the next day. (2) The extraction is carried out continuously from the start to the finish without stopping even at night. (3) The extraction is carried out arbitrarily, making the total time the required period.

In the present paper, type 1 is called non-continuous extraction and type 2 continuous extraction.

(A) The Relation between the Time of Extraction and the Acid Value of the Acetone Extract in Non-continuous Extraction.

The sample of pale crepe was extracted for 8 hours in the day-time, the extraction stopped at the end of the day and acetone in the extraction cup lowered into the extraction flask. The sample in the extraction cup was left undisturbed until the start of extraction on the next day. The sample was wet with acetone during this suspension of extraction at night.

Time of extraction (hours)	*Sample (g)*	*Acetone extract (g)*	*Acetone extract (%)*	*Acid value (A)*	*Acid value (R)*
1	1.3906	0.0420	3.02	106.7	3.22
2	1.4400	0.0476	3.31	105.9	3.50
3	1.8016	0.0595	3.31	103.5	3.42
4	1.6638	0.0540	3.25	103.7	3.36
5	1.9061	0.0644	3.39	100.0	3.38
6	1.8420	0.0600	3.26	102.7	3.34
7	1.6934	0.0545	3.22	102.8	3.31
8	1.7264	0.0630	3.65	93.3	3.41
10	1.9447	0.0729	3.75	92.2	3.52
12	2.0008	0.0763	3.82	88.1	3.42
14	1.8700	0.0710	3.80	90.7	3.44
16	1.7668	0.0632	3.57	97.5	3.41
18	1.4904	0.0561	3.76	94.8	3.56
20	1.7200	0.0590	3.43	94.9	3.26
22	1.6856	0.0590	3.50	94.9	3.32
24	1.6664	0.0586	3.52	95.6	3.36

(B) The Relation between the Time of Extraction and the Acid Value of the Acetone Extracted Residue in Non-continuous Extraction.

The acetone extracted residue from the sample extracted in experiment (a) above was placed in a flask containing 50 cc of ethyl alcohol, and acid value then determined as mentioned in paper I.

Time of extraction (hours)	*Sample (g)*	*Acetone extract (g)*	*Acetone extracted residue (g)*	*Acid value of acetone extracted residue*	*Acid value (R)*
1	1.3906	0.0420	1.3486	0	0
2	1.4400	0.0476	1.3924	0	0
3	1.8016	0.0595	1.7421	0.3	0.3
4	1.6638	0.0540	1.6098	0.4	0.3
5	1.9061	0.0644	1.8417	0	0
6	1.8420	0.0600	1.7820	0	0
7	1.6934	0.0545	1.6389	0	0
8	1.7264	0.0630	1.6634	0	0
10	1.9447	0.0729	1.8718	0.3	0.3
12	2.0008	0.0763	1.9245	0	0
14	1.8700	0.0710	1.7990	0.3	0.3
16	1.7668	0.0632	1.7036	0	0
18	1.4904	0.0561	1.4343	0	0
20	1.7200	0.0590	1.6610	0.3	0.3
22	1.6856	0.0590	1.6266	0	0
24	1.6664	0.0586	1.9078	0	0

(C) The Relation between the Time of Extraction and the Acid Value of the Acetone Extract in Continuous Extraction.

The results of extraction up to 8 hours are the same as in (a), the figures for the extraction longer than 8 hours being given in the following table:—

Time of extraction (hours)	*Sample (g)*	*Acetone extract (g)*	*Acetone extract (%)*	*Acid value (A)*	*Acid value (R)*
10	1.8540	0.0540	2.92	88.0	2.68
12	1.2500	0.0376	3.01	89.4	2.69
14	1.6276	0.0584	3.59	91.1	3.27
16	1.6279	0.0586	3.60	90.8	3.27
18	1.6954	0.0612	3.61	96.1	3.47
20	1.6714	0.0532	3.18	94.7	3.18
22	1.7268	0.0534	3.09	89.2	2.77
24	1.5834	0.0512	3.23	93.0	3.01

(D) The Relation between the Time of Extraction and the Acid Value of the Acetone Extracted Residue in Continuous Extraction.

The figures for extractions longer than 8 hours are shown in the following table:—

Time of extraction (hours)	*Sample (g)*	*Acetone extract (g)*	*Acetone extracted residue (g)*	*Acid value of acetone extracted residue*	*Acid value (R)*
10	1.8540	0.0540	1.8000	0	0
12	1.2500	0.0376	1.2124	0	0
14	1.6276	0.0584	1.5692	0	0
16	1.6279	0.0586	1.5693	0	0
18	1.6954	0.0612	1.6342	0.2	0.2
20	1.6714	0.0532	1.6182	0.2	0.2
22	1.7268	0.0534	1.6734	0.2	0.2
24	1.5834	0.0512	1.5322	0	0

Summary of Results

In the extraction of pale crepe with acetone, the free fatty acids were almost all removed in 1 to 2 hours' extraction. Acid value (A) had a tendency to decrease gradually up to 12 hours' extraction, but it increased gradually after 12 hours. The cause of the decrease of acid value (A) from the start of extraction up to 12 hours is thought to be due to:—(1) a gradual increase of non-acid compounds extracted with increased time of extraction, (2) neutralization of the acids by other compounds, such as esterification. The cause of the increase of acid value (A) after 12 hours is thought to be due to:—(1) formation of free acids by the decomposition of esters, (2) formation of acids by oxidation. From the fact that the acid value of the acetone extracted residue is almost nil even after only 1 hour's extraction, acetone extraction for 1 hour extracted almost all the free acids contained in pale crepe. Therefore, the change of acid value of the acetone extract with increase of time of extraction is not due to a change which some other compounds extracted might give but it must be due chiefly to the change in the acetone solution of the extract during extraction. From these results, the free acids are thought not to be present in such condition as absorbed in raw rubber nor combined molecularly but to be dissolved in raw rubber. So far as the change of free acids in the acetone extract is concerned, the acetone extract is very liable. Therefore, in storing the acetone extract, whether it is dried or even in acetone solution, care must be taken not to store it too long. And the acetone extract obtained during very long periods of extraction is believed to have undergone some change.

IV. The Relation between the Time of Saponification and Saponification Value of Raw Rubber and its Acetone Extract.

The determination method of the saponification value of pale crepe and its acetone extract is studied.

(A) Alcoholic potash for the determination of saponification value.

As to the concentrations of the alcoholic potash and of the HCl solution for titration, $N/5$ and $N/10$ were found to be respectively suitable. The amount of $N/5$ alcoholic KOH used for the determination was 20 cc.

(B) The relation between the time of heating with alcoholic KOH and the saponification value of raw rubber.

Sample of pale crepe was placed in a flask and 20 cc of alcoholic KOH added. After heating for varying times, the solution was titrated with $N/10$ HCl solution using phenolphthalein as indicator. The number of milligrams of KOH necessary for 1 gram of raw rubber was expressed as saponification value (R), the results being as follows:—

Sample (g)	*Time of saponification (m)*	*N/10 HCl (cc)*	*Saponification (R) value*
2.1714	30	2.05	5.29
1.8158	60	2.3	7.10
1.9748	90	2.55	7.23
1.8058	120	2.7	8.38
1.8892	150	3.1	9.19
1.3068	180	2.55	10.93

Taking the time of saponification in minutes as abscissa and saponification value (R) as ordinate, time-saponification curve is convex up to 60 minutes and concave after this time, there being a point of inflection at 60 minutes. It may be seen from the curve that saponification proceeds gradually to 60 minutes, after this time the rubber, which is now fully expanded, absorbs KOH gradually. Therefore, 60 minutes is considered to be a suitable time of saponification.

(C) The relation between the time of saponification and the saponification value of the acetone extract.

(a) Acetone extract from 8-hour continuous extraction.

Five sheets of the pale crepe sample were taken and extracted continuously with acetone for 8 hours and the acetone solution of the extract was poured into a measuring flask of 250 cc capacity. Acetone was then added to the mark. Four lots of 50 cc were pipetted out into weighed flasks, the acetone evaporated off, and the extract dried and weighed. Twenty cc of alcoholic KOH was added to

the acetone extract thus obtained and heated on a water bath for 60 minutes. The excess KOH was titrated back with $N/10$ HCl using phenolphthalein as indicator. The number of milligrams of KOH necessary to saponify 1 gram of acetone extract is expressed as saponification value (A).

Sample (5 sheets) 7.2808 g

Actone extract (g)	0.0478	0.0508	0.0468	0.0468
Acetone extract (%)	3.28	3.49	3.22	3.22
Time of saponification (min.)	15	30	60	90
$N/10$ HCl (cc)	1.25	1.55	1.5	1.5
Saponification value (A)	146.4	170.9	179.5	179.5
Saponification value (R)	4.81	5.96	5.77	5.77

The heating time for saponification is next considered from the standpoint of change of ester value as follows:—

Acid value (A)	*Acid value (R)*	*Time of heating (min.)*	*Ester value (A)*	*Ester value (R)*
104.1	3.60	15	—	—
104.1	3.60	30	—	—
100.3	3.44	60	—	—

(See Table 2 in the previous paper I)

Saponification value (A)	*Saponification value (R)*	*Time of heating (min.)*		
164.4	4.81	15	42.3	1.21
170.5	5.96	30	66.8	2.36
179.5	5.77	60	79.2	2.33

(See Table 2)

In the above table, the ester value of the acetone extract is entered as ester value (A) and the ester value of the original raw rubber as ester value (R). It can be seen from the above table that saponification is complete in 60 minutes.

(B) THE ACETONE EXTRACT FROM 16-HOUR CONTINUOUS EXTRACTION

Sample (5 sheets) 7.8200 g

Acetone extract (g)	0.0514	0.0536	0.0554	0.0524
Acetone extract (%)	3.29	3.43	3.55	3.35
Time of saponification (min.)	15	30	60	90
$N/10$ HCl (cc)	1.2	1.25	1.35	1.35
Saponification value (A)	130.7	130.6	136.5	144.3
Saponification value (R)	4.29	4.48	4.83	4.83

(C) THE ACETONE EXTRACT FROM 24-HOUR CONTINUOUS EXTRACTION

Sample (5 sheets) 8.1377 g

Acetone extract (g)	0.0628	0.0602	0.0527	0.0567
Acetone extract (%)	3.86	3.70	3.23	3.49
Time of saponification (min.)	15	30	60	90
$N/10$ HCl (cc)	1.45	1.4	1.4	1.4
Saponification value (A)	129.3	130.2	148.8	138.2
Saponification value (R)	5.00	4.82	4.82	4.82

Summary of Results

(1) For the determination of the saponification value of the acetone extract, 20 cc of $N/5$ alcoholic potash is added to the extract and the flask is heated on a water bath for 60 minutes. It is then titrated with $N/10$ HCl solution, using phenolphthalein as indicator.

(2) When the saponification value of the acetone extracts of 8 hours, 16 hours and 24 hours are compared, the saponification value of the 8-hour extract is seen to be high while those of 16- and 24-hour extracts are low. This indicates: (a) That the 8-hour extract contains a higher percentage of saponifiable matter than the 16- and 24-hour extracts. (b) The quantity of rubber hydrocarbon which is dissolved in the acetone extract increases with increasing time of extraction. (c) The acid value of the acetone extract decreases during the period of extraction from 16 to 24 hours.

(3) Regarding the saponification value (R) of the acetone extracts of 8, 16 and 24 hours, similar remarks may be made as in (2) above.

Thiokol Molding Powder

RECENTLY introduced by the Thiokol Corporation, of Yardville, New Jersey, Thiokol Molding Powder is fully vulcanized and compounded, and merely requires forming in the press for approximately 3 minutes at temperatures around 300° F. In this manner, according to the manufacturer, synthetic oil-proof rubber molded products may be produced at reduced costs.

At present two types of Thiokol molding powders are available: No. 1 with a hardness of 72 (on a Shore durometer) and No. 2 with a hardness of 55. Both powders are black in color. Products made from these molding powders are said to have excellent aging qualities and unusual stability against sunshine, oxidation and ozone, as well as a mild and not objectionable odor.

Thiokol molding powders occupy three and one-quarter times the volume in the powder form that they do when in the solid form. This means that the ordinary rubber molds cannot be used, as the cavity is just made to the shape of the article to be molded, and there is no place for holding the powder before molding.

A plunger or follower type mold would be required with a cavity three and one-quarter times the volume of the finished molded article. Flat sheets could be made without a mold merely using spacer irons in the press for thickness and heaping the powder in the center in a pile.

In molding, a definite weight or volume of the powder should be put into the mold cavity, then the mold closed and put into the press. The press should be brought down slowly or else brought down part way, and allow one or two minutes for the material to warm up, then close the press completely and allow two or three minutes for the Thiokol to flow and knit together. If sufficient time is not allowed, the powder will not flow together completely and will give a tough, porous product. Small objects have been molded in three minutes and large one-half inch sheets in five minutes.

Extent of Tire Retreading

ON THE basis of what is termed "incomplete but indicative trade association data" some 2,000,000 casings will be retreaded this year by small establishments throughout the country, according to the Leather and Rubber Division of the Department of Commerce, the result of which is the taking place of a decentralization of tire manufacture, current estimates stating that 4% decentralization has already occurred. The retreads take the place of an equivalent number of low-price new tires.

Some retreaders, and one or two small tire companies, are experimenting with the idea of building new carcasses to supply retread demands. A few manufacturers are said to be discontinuing production of certain low-price tires formerly made, the effect of which would be to make the purchase of new tires more costly.

This has a noticeable influence on crude rubber consumption, but the extent of this influence is not yet measurable in exact terms. Some reputable retreaders are guaranteeing retreads to furnish 75 per cent to 85 per cent of the mileage rendered by new tires. A properly retreaded first line carcass will usually give better mileage for less money than the cheap brands of new tires made by manufacturers for the price market, it is claimed. Since retreads use only about 50 per cent as much rubber, on the average, as new tires, the effect might be roughly estimated to amount to 4,000 tons of rubber on an annual output of 2,000,000 retreads. Not yet a very large factor, it is by no means negligible, and is capable of considerable multiplication on a basis of possible world-wide growth of the retreading industry.

1935 Chemical Achievement Award

Organic Chemicals Department of Du Pont Awarded Chemical and Metallurgical Engineering Plaque for Synthetic Developments

THE 1935 award for outstanding chemical engineering achievements, made bi-annually by *Chemical and Metallurgical Engineering*, was presented to the Organic Chemicals Department of E. I. du Pont de Nemours & Company, Inc., at a dinner held at the University Club in New York City, on December 6. In the opinion of the Committee of Award, du Pont earned the 1935 award, which consists of a bronze plaque, by virtue of its "successful large-scale production of synthetic rubber, synthetic camphor, and a variety of other essential organic chemicals and dye-stuffs." The Committee had considered many other companies for their various achievements in the past two years, but it felt that the synthesis of rubber and camphor and other essential materials developed by du Pont engineers merited the award above those of all other companies.

The inauguration by *Chemical and Metallurgical Engineering* in 1933 of this signal honor for outstanading chemical achievement was in recognition of the desirability of establishing some medium of reward for group effort and industrial teamwork, as distinguished from the large variety of awards for the individual performances of scientists, engineers and industrialists. These awards are presented bi-annually in connection with the chemical expositions sponsored by the International Exposition Company, the 15th of which was held in Grand Central Palace, in New York City, from December 2 to 7. The first award, in 1933, was made to the Carbide and Carbon Chemicals Corporation for its unique accomplishment in establishing a synthetic aliphatic chemical industry in the United States.

Sidney D. Kirkpatrick, Editor of *Chemical and Metallurgical Engineering*, acting as toastmaster at the presentation dinner, referred to the du Pont slogan—Better Things for Better Living, through Chemistry—as "something more than a slogan . . . a business creed that has molded and guided the work of thousands of chemists and chemical engineers." He stated that the latest and most striking of chemical achievements has been "the successful commercial synthesis of two of Nature's most useful materials—rubber and camphor. We refer to them as 'synthetic' products but the time is coming, and shortly too, when the term 'synthetic' will have a new meaning. Instead of implying artificiality or substitution, it will come to be synonymous with scientific advance—actual improvements over the products of Nature."

In describing the purpose of the Award, Mr. Kirkpatrick mentioned the "multiplicity of medals, honors and prizes awarded for outstanding accomplishments of the individual." Included among such awards are the Nobel prizes, the Perkin medal, sometimes referred to as the "Badge of Knighthood in American Chemistry," the Nicholls' medal, the latest recipient of which was Father J. A. Nieuwland, of Notre Dame University, for clearing away many of the obstacles in the path of the successful commercial production of synthetic rubber, and many others. These each serve a useful purpose, stated the toastmaster, but he stressed the point that "outstanding industrial achievements are becoming more and more the result of coordinated effort of many individuals—of the systematic endeavor of a well-rounded organization." In recognition of this growing importance of group effort in industrial research development the new award was established. Mr. Kirkpatrick then turned the speaker's chair over to Mr. Albert E. Marshall, president of the American Institute of Chemical Engineers, and chairman of the Committee of Award.

Replica of the 1935 Bronze Plaque.

In his opening remarks, Mr. Marshall paid tribute to the chemical engineers who develop new products and processes for American industry through their research activities. He mentioned the difficulty of selecting an outstanding organization to receive the 1935 Award because of the unusual research activity conducted since presentation of the 1933 Award which has resulted in many new developments.

Mr. Marshall briefly mentioned several of the new products and processes that the Committee of Award considered, among these being the Dow Chemical Company's achievement in recovering the element bromine from seawater which has resulted in the recovery of more than half a million pounds of bromine each month from almost fifty million tons of sea-water; Dow's development of the process for recovering a sister-element, iodine, from the salt brine wasted in California oil fields; the progress of the so-called "polymerization process," bound to result in more and better gasoline for the motoring public, conducted by three different companies; the successful casting and subsequent cooling and annealing of the great 200-inch disc for the new telescope to be built at the Mount Wilson Observatory by the Corning Glass Works; etc.

Coming to the selection of du Pont and the reasons for such selection for the 1935 Award for Chemical Achievement, Mr. Marshall said:

"The synthetic rubber, 'DuPrene,' is made from ordinary acetylene gas such as we used to use a generation ago in our bicycle lanterns and Prestolite lamps for the first automobiles. Synthetic camphor is made from American turpentine. In both instances the basic chemistry of these processes have been thoroughly worked out in university and industrial research laboratories here and abroad. The big problem that was put up to the du Pont chemical engineers was the translation of these interesting and sometimes academic theories into practical and profitable processes that would operate under American conditions. That was accomplished through a most remarkable example of coordinated group effort. This achievement, in a sense, served to dramatize all of the 20 years of patient investment and development which the du Pont Company has contributed toward the building of a great dyestuff and organic industry in the United States."

Turning to Mr. Irenée du Pont, chairman of the du Pont organization, Mr. Marshall stated that in the opinion of the Committee of Award, "the great single asset of the du Pont companies is the ability of your chemical engineers to solve, through coordinated group effort, these complicated problems in the development of new products and processes . . . I feel that I speak for them (the chemical engineering profession as a whole) as well as for our committee and its sponsors in presenting to you this 1935 Award for Chemical Engineering Achievement."

In a brief speech of acknowledgment of Mr. Marshall's remarks, Mr. du Pont stated that "the honor, however, should most certainly go to our Organic Chemicals Department since the achievements you have mentioned were entirely theirs. Therefore, instead of accepting this Award on behalf of the du Pont Company as a whole, I should much prefer to hand it over immediately to my deserving friend and colleague, Mr. Edmund G. Robinson, General Manager of the Organic Chemicals Department."

Robinson's Speech of Acceptance

The reply of Mr. Robinson, in his speech of acceptance, was briefly as follows:

"I deeply appreciate the opportunity to accept on behalf of the Organic Chemicals Department of E. I. du Pont de Nemours & Company, the honor for which this distinguished committee and *Chemical & Metallurgical Engineering* have selected us. It is a great pleasure to meet with you on this occasion and to extend the thanks both of our Department and of the du Pont Company management for this recognition. Such an award cannot fail to stimulate the recipients to do more earnest and better work in order to deserve it.

"I think it is a particularly happy thought to make this award to a group instead of to an individual. In the development of an organic chemical industry and to products like 'DuPrene' and Synthetic Camphor many individuals must contribute their share to the research, the design, the construction and the plant operation, each of which is an essential step in the commercial development. With our organization, this means that not only the Organic Chemicals Department but other departments of the du Pont Company as well deserve to be recognized for their share in this achievement. Our Chemical and our Engineering Departments, particularly have contributed no small part to bringing the manufacture of these products to a successful commercial scale.

"The first major entrance of the du Pont Company into the organic chemicals industry was in 1917. After considerable study of the situation which had been revealed by the World War, the company decided that it was essential that this country be freed from the dominating grip of the foreigners in this respect. I will not waste time describing the extent to which, theretofore, American industry had been dependent upon foreign sources for necessary dyestuffs and other organic chemicals. That is an old story. Suffice it to say that the du Pont Company, recognizing that this industry was important in many ways to the national welfare, and that it could be successfully entered only by a company able and willing to invest very large sums of money, started at that time the enterprise which has grown into its present Organic Chemicals Department and which has made possible developments of which "DuPrene" and Synthetic Camphor are the typical examples recognized by your Committee. . . .

Brief Description of "DuPrene"

"I do not wish to discuss in detail the development of 'DuPrene.' I think you are all familiar with the fact that the du Pont chemists, seeking for a synthetic product which would have the peculiar properties of natural rubber and recognizing that acetylene was a desirable starting point, learned of new acetylene reactions developed by Father Nieuwland of Notre Dame University. The product which he had obtained by the condensation of acetylene with itself—divinylacetylene—possessed the type of chemical linkage they desired. When attempts to obtain a satisfactory polymerized product from this raw material were unsuccessful they next turned to monovinylacetylene which can be produced simultaneously in the same condensation reaction, and finally obtained, by addition of hydrogen chloride, a chlorinated hydrocarbon which, under proper conditions, yielded a satisfactory polymer.

" 'DuPrene' is not rubber in the specific sense, but is a product which for many purposes is superior to rubber and is today gradually being used for more and more commercial purposes, for which its peculiar properties make it particularly suitable. Much has been said about its superior resistance to oil, gasoline and many other solvents as compared with natural rubber, but its exceptional resistance to flex-cracking and oxidation are of even greater importance from the point of view of the rubber technologist. Because of these properties 'DuPrene' has replaced natural rubber for many purposes and has created also new markets for the rubber industry since it can be used for purposes for which natural rubber is totally unsuitable. Perhaps there is less general recognition of its great resistance to oxidation and to flex-cracking. This product will be used in manifold places where the elasticity of rubber is required but, where due to the conditions of exposure, the life of natural rubber is too short.

"Those of you who are chemical engineers can readily appreciate the difficulties of establishing on a production scale apparatus of satisfactory design and material, methods of control, etc., efficiently to carry out on such scale a series of reactions which on paper may look extremely simple. When to these natural difficulties is added the requirement that yields, labor efficiencies, and power consumption must be such as to produce the finished product at a very low cost, the problem becomes great indeed.

With a new plant which has been completed this year it has finally been possible to increase our production to equal the demand of those rubber manufacturers who are eager to produce articles of 'DuPrene.' It will be our policy to expand our production as necessary to meet increasing requirements and we confidently believe that with the progress which has been made in the development of

(Continued on page 150)

Safety in Plant Operation

Firestone's Method of Plant Safety by Placing Responsibility in the Hands of Departmental Foremen is Proving Successful

By T. E. Pittenger
Factory Manager, Firestone Tire & Rubber Company

THE Firestone Tire and Rubber Company employs approximately 10,000 clock employees in the Akron factories, and it has subsidiaries in California, Canada and several of the foreign countries. In my earlier experiences in industry, it was my observation that executives employed safety engineers to prevent accidents and they held these men responsible for results without giving them sufficient backing and support. Managers felt that they had done their share when they provided a safe working place. Thus it was up to the men to take care of themselves. This was not on account of any lack of sympathy for injured employees but it seemed to be an unnecessary task to caution employees to be careful and to educate them in accident prevention when it seemed that the law of self preservation was sufficient.

Unfortunately proximity breeds contempt; workers must be taught to protect their own lives; every person considers himself more or less immune to accidents; and it requires positive initiative rather than mere passive hope if workers are to avoid injury.

While we have men specializing in safety, it is now our policy to place the responsibility of operating safely in the hands of our foremen. We believe the foreman is the key to successful factory operation. Our greatest problem is to get our policies down to the foreman so that he can interpret them to the employees.

Heavy steel toe plates protect the feet of Firestone loaders from damage from the lead pigs which weigh about 85 lbs. each.

Safety shoes with patent steel box toes prevent foot injuries from falling shell bars and other heavy objects as depicted.

We have never made it a practice to get groups together to discuss safety, or, in fact, to discuss any other problems, but have always felt that the greatest progress could be made by instructing the individual foreman. It is our experience that in too many of these group meetings we find too many of the people inattentive, half asleep, and not knowing what it is all about. The foreman who is accustomed to an active life finds it trying to sit in meetings and keep his attention upon the subject under discussion.

When new machinery is installed, and where the machinery is complicated at all, we have what is known as the "Safe Practice Method," which we post on the machine and which we insist upon the employee following. If he does not follow this method, we hold the foreman responsible and he must take whatever steps are necessary to correct these practices. For example, we have punch presses which we have equipped with Possuns safety devices. When our foremen find employees operating these presses without having the devices hooked up, something must be done about it. When we find our employees operating these presses, even though they are hooked correctly to the employees' hands, but have not been correctly adjusted, then *we* do something about it.

Another item we have followed closely is the handling of safety shoes. We sell through our employees' store hun-

This paper was presented at a meeting of the Rubber Safety Section of the National Safety Council on October 16 at Louisville, Kentucky.

dreds of pairs of safety shoes. We permit our employees to buy these shoes at cost on an easy payment plan.

In our mold engraving, where there is considerable exposure to chips and small particles in the air, we furnish goggles and insist that the employees wear them. You will always find some employee who wants to bring in a different pair or who just knows he doesn't need to wear goggles. If his foreman lets him get away with this he will find out he is wrong when it is too late.

It is useless to have a lot of safety devices and safety rules for the foreman if he is going to mix them all up and not know which one belongs to which machine.

The problem today, more I believe than at any other time, is that the foreman and superviser must show an interest in the individual employee. He must be receptive to questions and suggestions from the employee, and when the question is raised by the employee, he must get him an answer and within a reasonable length of time.

We all realize that the foreman has a multitude of problems. They include specific production problems, of which safety is one, and on these special problems, he must, at certain times, consult an expert. We insist that our safety man work back through the foreman and not independently.

It is my opinion that great good is accomplished by using safety contests. They should not, however, be held continually or too often. When you do this they become a routine matter.

We have found it extremely helpful to have boards in our departments whereon we post the number of days that the department has operated without a lost-time accident, and we have given publicity in our plant paper to the success of different departments. When a record of this kind is broken it is of concern not only to the management but to every employee.

A number of our departments have established enviable records for continuous operation without accidents. Our Gum Stores department, employing 17 people, has operated 2,901 days without a lost-time accident. Our Tube department employing 246 people has operated 1,207 days without a lost-time accident, one of our Stock Preparation departments, employing 118 people, has a record of 1,150 days, our Sidewall Assembly department, with 46 people employed, has a record of 1,158 days, and one of our Mechanical divisions, employing 28 people, a record of 1,229 days.

The progress Firestone has made in the past six years in reducing the number of accidents is shown in the following table:

	1929	1930	1931	1932	1933	1934
Number of lost time accidents ...	1051	296	179	45	17	18
Number of compensable accidents	402	163	125	59	66	93
Total	1453	459	304	104	83	111
Per cent. improvement..		69	34	66	20	—34

The increase in 1934 is accounted for by the NRA causing an abnormal increase in new and inexperienced workers.

Rubber Plays Merchandising Role

(Continued from page 142)

were molded for the company by the Elmhurst Rubber Company. All latex impregnating operations are accomplished at the Messmore and Damon factory at 9th Avenue and 27th Streets. All of the Gimbel exhibits, which are wired for sound, occupy more than a block of space on the sixth floor of the emporium.

As previously mentioned, rubber figures of gigantic proportions again featured the Macy Thanksgiving parade, this year's fete being the eleventh annual one to be held. In the past Goodyear produced all the rubber figures used in the parade, but this year Goodyear supplied only two of the figures, a turkey and an Indian, while Tony Sarg, who designed all of the figures used in the parade, constructed several of the characters used.

The feature of the parade, however, was the thirty foot turkey, symbolic of good cheer, and the 58 foot Indian which towered majestically over New York City's Times Square as it "chased" the turkey down Broadway. Thirty men were required to hold down the turkey, while an equal number, or more, were needed to anchor the Indian.

As usual, these fantastic balloons were made of rubberized fabric and filled with helium gas. In previous years Macy's has used such rubberized fabric balloons as dragons, two-headed giants, and similar monstrosities. These figures were produced by Goodyear's balloon experts at Akron.

1935 Chemical Achievement Award

(Continued from page 148)

the process, this can be done. Moreover, it has been our policy to sell 'DuPrene' at prices based not upon the current cost of manufacture, but upon costs which we expected to realize.

"I am confident that the group of chemists and engineers who have already contributed so much to the establishment of our synthetic rubber industry will go much further in the future with the result that we will be able to reduce the cost of 'DuPrene' to rubber manufacturers to such a degree that it may displace natural rubber to a very large extent. All of our chemists and engineers who have been working on 'DuPrene' are striving toward this goal and I suspect that the ultimate result may exceed even their most sanguine expectations.

"The development of Synthetic Camphor, which your Committee has seen fit to mention especially in connection with this award, is another example of the result of the application of chemical engineering to the problem of carrying out on a commercial scale and on an economical basis a synthesis the chemical steps of which are comparatively simple. . . .

"It is obvious that an organic chemical industry is a source of continual developments in the form of new aids to other industries and that its scope is limitless. It is equally obvious that the existence of such an industry is an essential factor in our national life. The new products and materials produced by organic chemistry enter our daily lives in a multitude of ways producing truly better things for better living."

The Committee of Award which selected du Pont to receive the 1935 Award for Chemical Engineering Achievement consisted of eight representative leaders of science and industry, these being: Charles E. Adams, president of the Air Reduction Company; Charles Belknap, president of the Merrimac Chemical Company and executive vice president of the Monsanto Chemical Company, Chairman of the Executive Committee of the Manufacturing Chemists Association of the United States; Dr. Harry A. Curtis, Chief Chemical Engineer of the Tennessee Valley Authority; Dr. John Van Nostrand Dorr, president of the Dorr Company; Walter A. Schmidt, president of the Western Precipitation Company of Los Angeles; Dr. Milton C. Whitaker, vice president of the American Cyanamid Company; Professor Alfred H. White, head of the Department of Chemical and Metallurgical Engineering at the University of Michigan; and the Chairman, Mr. Albert E. Marshall, consulting chemical engineer and president of the American Institute of Chemical Engineers.

New Equipment

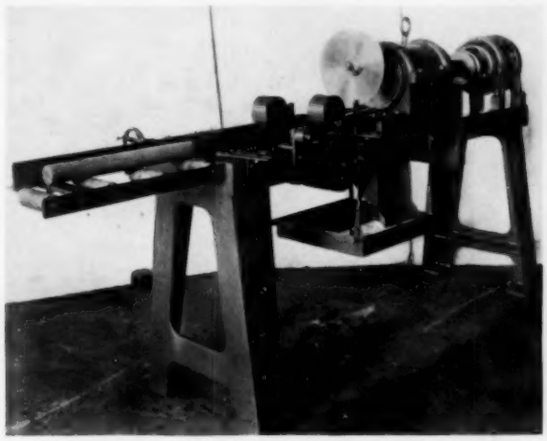
Heinrich Electric-Hydraulic Vulcanizer

STATED to be the first successful electrically-ehated platen press for use in the rubber industry, an electric-hydraulic vulcanizer has been introduced by H. H. Heinrich, Inc., 200 Varick Street, New York City. It is adaptable for molding rubber articles of exact dimensions, and is clean and noiseless in operation. Time, temperature and pressure are automatically controlled. The vulcanizer is

self-contained and is portable within the plant. It is operated by hydraulic pressure with a motor-driven oil pump. A handle on the right side of the machine opens and closes the pressure release valve. Two push buttons control the starting and stopping of the motor which raises the lower platen. A switch connection is used for turning on the heat. While the switch is in the "on" position a red light glows indicating that the vulcanizer is being heated. A thermometer on top of the apparatus furnishes a constant check on the heat produced while vulcanizing. Other instruments include pressure gauge, timing clock and thermostat. The electrical apparatus is completely enclosed in an intermediate chamber. The Heinrich Electric-Hydraulic Vulcanizer has also been utilized in the manufacture of rubber printing plates and the molds from which these plates are made.

Utility Automatic Slicer

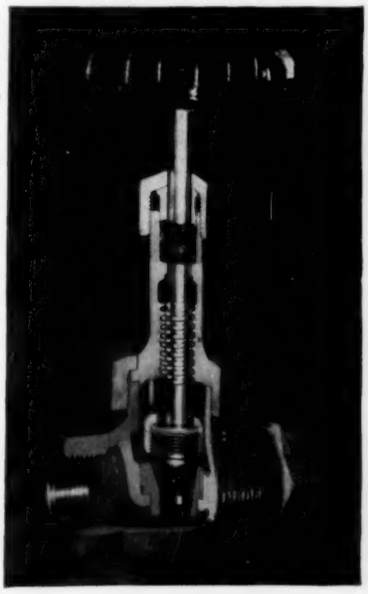
A NEW slicer for extruded stocks is being featured by the Utility Manufacturing Company, Cudahy, Wisconsin. The machine has a power driven disc blade which operates on a crank, power being furnished by a 3 h.p. motor through a special gear housing to a central shaft which drives the cutting blade. An automatic feed device, made with tandem wheels, and which is adjustable during operation, feeds the stock to the self-wetting blade, which operates at 1720 r.p.m. The standard size machine handles stock 3 inches thick by 4 inches wide, and slices from ⅛ to 6 inch lengths. The cutting speed is dependent on length and section of the stock and is from 75 to 150 cuts per



minute. When running stocks of small diameter, a layer 4 inches wide can be handled at one time. The machine is simple in construction and operation and has been specifically designed for high capacity performance. The illustration shows the machine with guard removed.

Hancock Globe Valve

CONTAINING a number of features which are claimed to increase its wearing qualities, a new union bonnet bronze globe valve has been developed by the Hancock Valve Division of the Consolidated Ashcroft Hancock Company, Bridgeport, Conn. Among the new features are superhard stainless steel valve discs and seat rings (hard-



ened to 500 Brinell) said to prevent wire drawing, steam cutting and galling. The disc is attached to the stem in a manner that facilitates grinding. The design provides tight-back seating and is said to permit easy repacking while the valve is in pressure service. The new valve is made for steam pressures up to 300 lbs. and is available in both globe and angle patterns.

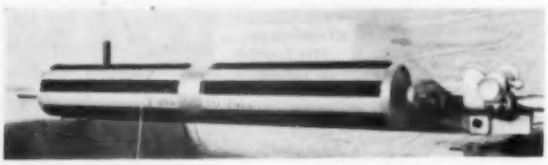
Waldron Cross Type Coupling

INTENDED for light duty motor drives where misalignment of connected shafts is unavoidable, the John Waldron Corporation, New Brunswick, N. J., has introduced the Waldron Cross Type Flexible Coupling. It is of the

totally enclosed lubricated type, and is dust and moisture proof. These couplings can be selected on a basis of maximum bore due to the lubricated, evenly loaded, large bearing areas which remain unchanged under all operating conditions. Each size has ample capacity to safely transmit the load of a motor whose shaft diameter is within the maximum bore of the coupling. Since the hole in the end of the grease cover is concentric with the hub when connected shafts are in line, alignment may be checked without disturbing coupling.

7" Patent Rotary Scrimp Brush

IN addition to its 3 inch diameter Patent Rotary Scrimp Brush, the Bristle Stretcher Expander Company, Somerville, Mass., has brought out a larger size of approximately 7 inch diameter. These brushes act as guide rolls in addition to removing wrinkles and creases from



materials. They are made in all widths and are fitted with ball bearings. The brushes are used before such machines as calenders, winders, printing machines, etc., wherever wrinkling removal is required. In the rubber industry they are specifically intended for use before calenders, spreaders, inspecting and winding machines.

Book Reviews

THE CHEMISTRY OF SYNTHETIC RESINS. In two Volumes. By Carleton Ellis. Published by Reinhold Publishing Corp., 330 West 42nd Street, New York City. 1626 pp. $19.50.

In 1923 Mr. Ellis, widely-known industrial research chemist, wrote "Synthetic Resins and Their Plastics." The book reviewed here is intended to replace the earlier work and was prepared for such purpose because of the large number of synthetic resins and synthetic products which have come to the fore in recent years. The worth of the new volumes may be realized from the fact that almost 15,000 individual patent references are made in the 70 chapters, the index alone containing 206 pages exclusive of the "Trade Names" list of some 1,000 items. Space does not permit a resume of the hundreds of subjects covered. Suffice it, therefore, to state that the minor as well as major developments in the field of synthetic resins have been brought up to date, with their history, development, fabrication and applications discussed. The subject of modified rubber and synthetic rubber occupies approximately 60 pages, although constant references to the use of resins in the manufacture of various rubber products are made.

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A.S.T.M. STANDARDS ON RUBBER PRODUCTS. Prepared by Committee D-11 on Rubber Products. Published by the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, Penna. 204 pp. $1.25.

This is the first time that a compilation of the A.S.T.M. standards on rubber products has been made available in published form. It contains all of the 21 specifications and tests of the Society for rubber products, in addition to a proposed specification currently under consideration, and a condensed bibliography. Standardized procedures for physical testing, tension testing, adhesion, hardness, abrasion resistance, chemical analysis, adhesion of rubber to metal, compression set, accelerated aging and flexing, are included in the compilation. Rubber hose, of both braided and wrapped construction, and rubber belting used for power transmission, are also covered by tests. Specification requirements, including prescribed tests, are given for a number of rubber products.

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BRAKE LININGS. Volume 1. Prepared and published by T. R. Stenberg, Firestone Park Station, Akron, Ohio. 91 pp. $2.00.

The material contained in this book, the first of a series to be issued by the publisher, is intended to serve as a source of information on brake linings. The material, gathered by research and practical experience, is arranged to present answers to questions about brake lining in simple, concise English, with many explanations following the style which has proved successful in brake school teaching. This first issue consists of 10 chapters ranging from the "Brief History of Braking and Brake Lining" to "Brake Lining Failures and Troubles." Some chapters treat with impregnation problems, use of rubber compounds, molded fabric lining, etc. The series will be known as the Brake Library. It should prove of value to mechanics, salesmen, fleet operators, designers and manufacturers in general.

•

HANDBOOK OF CHEMISTRY AND PHYSICS. Twentieth Edition. Prepared by Charles D. Hodgman, M.S. Published by the Chemical Rubber Publishing Company, Cleveland, Ohio. 1951 pp. $6.00.

This latest edition to the series of handbooks on chemistry and physics contains approximately 300 pages more than the previous issue. Many of the tables have been completely revised and rewritten and many pages of wholly new material have been added. Through the cooperation of Dr. Austin M. Patterson, of Antioch College, the table on "Physical Constants of Organic Compounds" has been enlarged in scope and changed in form. A formula index of organic compounds referring by number to the compounds listed in the table has also been compiled and added. Changes have been made in the sections devoted to x-ray spectra, magneto-optic rotation, colorimetry, and photometry. The latest edition is replete with mathematical and general chemical tables, and information on all subjects pertaining to chemistry and physics.

RUBBER REGULATION AND THE MALAYAN PLANTATION INDUSTRY. Published by the Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, D. C. 46 pp. 10 cents per copy.

Submitted by American Vice Consul Harrison Lewis, of Singapore, and revised by E. G. Holt, assistant chief, Leather and Rubber Division, this report contains much information with regard to the working of rubber restriction in Malaya than has heretofore been available. It definitely aids American interests in more fully understanding the direction of events under restriction in Malaya up to the present time. The booklet, which is illustrated, thoroughly covers the situation from administration to estimated costs of production. It should make interesting reading for every American rubber manufacturer.

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HANDBOOK OF INDUSTRIAL TIRES. Published by The B. F. Goodrich Company, Akron, Ohio. 24 pp.

Intended for use by operating executives in practically all industries this booklet tells the story of rubber tires and rubber-tired wheels made by Goodrich for every type of interplant and industrial hauling. One section of the handbook is devoted to reviews of tests proving that rubber tires leave floors unharmed, while steel wheels on industrial equipment cause constant maintenance costs, in addition to other tests favorable to rubber. Another section gives hints on how to select the right tire for the particular type job and how to handle changeovers from steel wheels to rubber-tired equipment. A complete description of the new Goodrich "Vulc-On" rubber-tired industrial wheel is also included. Size and specification tables for many types of industrial tires made by the company round out the handbook.

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SELECTING A PLAN FOR COMPENSATING SALESMEN. Distributed by the Policyholders Service Bureau, Metropolitan Life Insurance Company, New York City. 28 pp.

Since sales policies are rapidly being modified in the light of changing business conditions, Metropolitan Life has gathered together the opinions of business leaders in many industries in this booklet. There is a tendency to shift to a commission basis during periods of depression. This has been true, according to the report, during the past several years. However, with business improving, many manufacturers are returning their sales personnel to a salary basis since such an arrangement permits greater control over the sales organization. Several varied plans of compensation to salesmen are discussed in the booklet, which should be of interest to sales manager and executives of all types.

•

AUDUBON WIRE CLOTH. (Catalog 40-30). Issued by the Audubon Wire Cloth Corporation, Philadelphia, Penna. 56 pp.

Comprised of 3 sections devoted to mesh wire, space wire and flexible wire cloths, respectively, this catalog includes illustrations, descriptions, specifications and list prices of the various Audubon products together with tables and some useful information for selecting and specifying wire cloth. Standard commercial specifications from 325-mesh to 6-inch space openings in various standard, special and patented weaves to meet the general requirements of all industries are listed in the catalog.

•

HEWITT HOSE FOR INDUSTRY. Distributed by the Hewitt Rubber Corporation, Buffalo, N. Y. 28 pp.

The complete line of industrial hose made by Hewitt is concisely described and illustrated in this well-printed, attractive, two-color catalog. All of the illustrations are printed in black against silver backgrounds which line the left and right hand margins of facing pages. In addition to brief specifications on each style of hose, tables in the catalog give properties of saturated steam, materials having a serious affect on rubber as well as those which have not, and wrought-iron and steel pipe sizes.

•

PROFITABLE PACKAGES. Issued by the National Metal Edge Box Company, Twelfth Street at Callowhill, Philadelphia, Penna.

This booklet, in words and pictures, concisely and simply tells the story of the Metal Edge method of packaging. Use of this method by several rubber manufacturers is described. Savings to be accrued from the use of this packaging system is explained in brief in the opening chapters of the booklet. It is recommended for perusal by sales and advertising executives.

A.S.T.M. STANDARDS ON ELECTRICAL INSULATING MATERIALS. Published by the American Society for Testing Materials, 260 S. Broad Street, Philadelphia, Penna. 312 pp. $1.75.

Prepared by Committee D-9 this compilation presents A.S.T.M. standards that are in widespread use for testing and evaluating electrical insulating materials. Twenty-five standardized methods of test and ten specifications are included in the 1935 edition. One method—that of testing shellac—has not been heretofore published. Revised specifications are given covering friction tape, rubber insulating tape and flexible varnished tubing. Other materials covered by specifications or tests include rubber gloves, rubber matting, silk and cotton tapes, asbestos yarns, untreated paper, etc. Procedures for thickness testing, impact, thermal conductivity and resistivity are also given in the book.

•

MICKEY MOUSE MERCHANDISE. Published by Kay Kamen, Inc., 729 Seventh Avenue, New York City. 80 pp.

A comprehensive view of the variety and the nature of Mickey Mouse and other Walt Disney character merchandise currently on the market is presented by this colorful catalog primarily prepared for merchandise managers and retail outlet buyers. In it is reproduced the Disney character merchandise manufactured by prominent American manufacturers. Actual reproductions of merchandise items, packaging and displays are a feature of the elaborate catalog. Mickey Mouse balloons manufactured by Oak Rubber and Disney character merchandise, ranging from sets of the three little pigs to a novelty hot water bottle, featured by Seiberling Latex, are included in the illustrative and descriptive section. Kay Kamen, Inc. is the exclusive representative for all Walt Disney enterprises.

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CARBON BLACK—SERVANT OF INDUSTRY. Catalog 135. Distributed by Imperial Oil & Gas Products Company, Pittsburgh, Penna. 24 pp.

The history and adaptability of carbon black are treated with briefly in this booklet. Imperial carbon blacks for use in the manufacture of tires, mechanical goods, footwear and miscellaneous products, are discussed. The properties of the two brands furnished by the company for use in the rubber industry, "Supreme" and "Excello," are given in table form. The booklet also describes carbon black uses in the printing, paint and miscellaneous industries.

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FIELD WAREHOUSING. Distributed by the Terminal Warehouse Company of New York, 27th Street and 11th Avenue, New York City. 32 pp.

Printed in terse, concise fashion, this book is intended to serve a dual purpose, i. e., as a manual on field warehousing in general and to answer questions about the "rapidly growing instrument of credit." It contains a brief definition of field warehousing, and then discusses its growth, typical examples, method of operation, charges (of Terminal), typical contracts, etc. The book should be of special interest to sales managers and other executives concerned with problems of distribution.

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THE TRUTH ABOUT RESTRICTION. By L. W. Holland. Published by Kelly & Walsh, Ltd., Raffles Place, Singapore, S.S. Available from American News Company, New York City. 25 pp.

This booklet consists of a series of articles reprinted from "The Planter," official organ of the Incorporated Society of Planters, in revised form. Written in concise, terse fashion, the author concerns himself with a comparison of the old seven day week and the new six day week, plus a chapter on "memorandum" in which he summarizes in paragraph form the ills of the rubber plantation industry. Pointing out that total world's stocks increased at the end of July, 1935, by 5,426 tons after thirteen months of restriction, he launches into an attack against such methods and in his summation states that "it is wrong to take things for granted . . . the industry is suffering from the wrong method of production, which is the cause of the apparent over-production." In his opinion, restriction cannot right the wrong method of production and is therefore doomed to failure. For a quick, accurate picture of the workings of the restriction scheme, written by one close to the source of rubber production, this booklet is heartily recommended.

Editorial Comment

THERE'S never a Christmas morning,
There's never an old year ends,
But somebody thinks of some one,
Old times,—old days,—old friends.
—*Selected.*

TO its hosts of friends in the rubber and allied industries, THE RUBBER AGE again extends its very best wishes for a Merry Christmas and a Happy New Year.

THE PUBLISHERS

"New Deal" Under Fire

ALTHOUGH industry at large has consistently gone on record as being opposed to the rules and regulations set down by the "New Deal" administration, the past month brought forth a combined attack that is still reverberating in the corridors of Washington. This opposition was expressed in two separate quarters, the first being the public declaration of the National Association of Manufacturers that "New Deal" methods from start to finish were obstructing recovery, and the second being the apparent lack of cooperation of trade associations with Major George L. Berry, Coordinator for Industrial Cooperation, who is endeavoring to revive the NRA in some modified form.

A new twist was given to opposition of the administration's policies by the NAM when it declared that it is being "forced in sheer self-defense to enter the political arena or be destroyed as a private enterprise." The Association claimed that the government has turned its back on the "American System" which, according to the NAM, includes the limitation of the powers of the Federal Government by the Constitution, the protection of certain inalienable rights even against majorities, encouragement of the maximum of achievement by all individuals by guaranteeing to each the rewards of his labors, and limitation of the control of the individual by the government to the possible minimum.

Instead of following this "system" of government, the NAM claims that the government is seriously hampering recovery by trying to control production, unduly regulating the financing of business, trying to regulate hours of work and rates of pay, and trying to regulate employer-employee relations which will "lead to political rule over both management and labor." Because of these conditions the NAM feels it must enter the political arena to force a return to the "American System" and in such wise hasten recovery through individual enterprise. In exactly what form it intends to enter that arena has not yet been made clear. The platform of objection, however, has been approved by many of the country's leading industrialists.

As mentioned, the second form of objection during the past month to government interference with business was in the attitude of leading national trade associations toward Major Berry's round-table conference. It is the administration's intention to establish an industrial council which would attempt to enforce regulations similar to those laid down by the defeated NRA. A surprising number of trade associations simply refused to send delegates to the conference; others ignored the invitation; still others refused to make any comment. Among this latter group was the Rubber Manufacturers Association, which, at a special meeting of the Board on November 4, decided not to send a delegate nor to issue any statement, maintaining a neutral position. As this is being written (December 10) the conference has been opened with a series of disorderly scenes marking the opening discussions.

Objections to the administration's business policies as strenuous as the outspoken attitude of the NAM and the "silent" attitude of national trade associations, leads us to believe that a "death knell" is being sounded for the current administration unless a radical change is made in many of its policies in relation to industry. The administration has not fared so well in its legal defenses of its many alphabetical organizations, its biggest blow having been the total defeat of the NRA by Supreme Court decision. Now it faces still another momentous decision in the Hoosac Mills case being reviewed by the same court to determine the constitutionality of enforcing the collection of process taxes. If the court decides such enforcement is unconstitutional, the complete agricultural regulation control of the administration will collapse. The rubber industry is concerned particularly with this case since its tire manufacturers pay processing taxes on the cotton used in tire construction, whether they raise and mill their own cotton, or whether they purchase it from independent sources.

Thus far the administration has been able to ward off all attacks on its policies, including one launched by the United States Chamber of Commerce. But no single body has had the strength of the National Association of Manufacturers, which, according to Clinton L. Bardo, president, represents 75,000 business enterprises employing between 12,000,000 and 15,000,000 workers. Plus this, the national trade associations which have adopted a *laissez faire* attitude, represent thousands of additional business concerns employing more millions of workers.

CURRENT • NEWS of the Rubber Industry

DECEMBER, 1935

RECOVERY KEYNOTE OF CHEMICAL EXPOSITION

American Chemical Society Exhibit Features "Children of Recovery"; Many Improved Machines Applicable to Rubber Production Shown

The 15th Exposition of Chemical Industries closed its doors at the Grand Central Palace, in New York City, on December 7, after a full week of playing host to chemists and engineers from all parts of the world. Included among the exhibits were chemicals and chemical products, materials handling equipment, laboratory equipment and supplies, containers and packaging equipment and metals and alloys.

Among the general exhibits, of which there were several, the outstanding exhibit was that conceived by the American Chemical Society. Termed the "Children of Recovery," as compared with the "Children of Depression" exhibit featured in 1933, this year's exhibit depicted a number of products born of research and first commercialized during 1934 and 1935. Several of these new products are of specific interest to the rubber industry, among them being the following:

List of "Recovery" Products

Tornesit, the chlorinated rubber now being produced in the United States by the Hercules Powder Company, principally as a paint base; Thiokol Molding Powder, a variation of the synthetic rubber developed by the Thiokol Corporation, which is fully vulcanized and compounded; Neo-Spectra, a high intensity black, which is vehicle-seeking instead of vehicle-repellent, generally used in alkyl resin enamels, a Binney and Smith Company development; Hiblak and Coblac, the former a colloidal carbon black for tinting concrete, pavements, etc., the latter a carbon black developed for use in nitrocellulose lacquer, two more Binney and Smith developments; and Zinc Sulfide Pigment made by a new process, freedom from acidity in rubber recommending its use, another Hercules Powder product.

In addition to these there were Areskap, Aresket and Aresklene, sulfonated and alkylated aromatic derivatives which are efficient wetting and spreading agents for reducing surface tension of aqueous solutions and in formulating products for rubber, textile, leather, etc., all three being recent developments of the Rubber Service Laboratories Company; Thermoflex A, a new antioxidant for the prevention of flex-cracking, a DuPont product; and the non-corrodable, acid-resistant, all-rubber drum introduced recently by the General Tire and Rubber Company, of which item Maurice A. Knight is sole distributor.

Included among machinery and equipment were literally hundreds of pieces of apparatus adaptable to the rubber industry, particularly time, temperature and pressure recording instruments. A few of these with direct relation to the rubber industry follow:

Colloid mills for use in latex compounding were exhibited by the Premier Colloid Co. (Premier), Chemicolloid Laboratories (Charlotte), Eppenbach, Inc. (Eppenbach), etc. A new pony churn was exhibited by the American Tool and Machine Company. The Gaulin Homogenizer, for latex compounding was displayed by the Manton-Gaulin Mfg. Co. Recovery stills for composition solvent reclaiming in rubber factories were shown by the Barnstead Still and Sterilizer Co. A pneumatic system for the manufacture of hard rubber dust, principally for phonograph records, was included in the exhibit of Federal Pneumatic Systems, Inc. Ovens for the aging of rubber were displayed by the Freas Thermo-Electric Co. Abbe Engineering Co., and its subsidiary, Beach-Russ Co., showed a line of pumps and mills including mills for latex compounding. The Werner & Pfeidler division of Baker and Perkins Co. exhibited a wide line of mixers of all types.

Among the testing and measuring instruments was the "Alnor" Temperature Pyrocon, product of the Illinois Testing Laboratories, Inc., for testing temperatures of rolls, molds and plastic rubber. This company also displayed a varied line of measuring instruments.

Wishnick-Tumpeer, Inc., manufacturers and importers of Witco carbon black and chemicals, maintained a booth at the exposition manned by several chemists. A simple exhibit, consisting of a row of bottled sample Witco chemicals, was the feature of the booth. Various types of packing manufactured from DuPrene, Du Pont's synthetic rubber, and Thiokol, were shown by the Garlock Packing Company.

Propeller De-Icer

In addition to the airplane wing de-icer featured by the B. F. Goodrich Company, a device for solving the problem when ice forms on propellers has been perfected by Goodrich engineers in cooperation with the U. S. Bureau of Air Commerce. A rubber-covered spinner cap treated with a special oil is used to prevent ice from bridging the hub. The propellers are also covered with rubber on the thrust side around the entering edge and back to the thickest portion. In such manner the tendency of the ice to stick is reduced with the natural result that centrifugal force throws it off before it has time to deform or unbalance the propeller blades. Another possibility lies in the continuous flowing of oil over the rubber-covered surface of the propellers while in flight to prevent any formation of ice in the first place.

CANADIAN AGREEMENT FAVORS RUBBER TRADE

Reciprocal Treaty Lowers Rate on Practically All American Rubber Goods Exported to Canada, with No Changes in Import Rates Made

The American rubber industry received an impetus toward increased trade with Canadian interests last month when President Roosevelt signed the reciprocal trade agreement between the two countries on November 15. In general, the agreement calls for mutual tariff concessions on commodities representing a large part of the trade between the United States and Canada.

Because the United States has always supplied the bulk of Canadian rubber imports, and due to the fact that the ownership and control of many of the important rubber manufacturing companies in Canada are in the hands of American corporations and individuals, the treaty provides for the reduction of tariffs on a number of rubber products exported to Canada but calls for no change in the tariff rates on products imported from the Provinces.

Tariff Changes Average 5%

The tariff rates affected by the agreement, according to the Leather and Rubber Division of the Department of Commerce, are usually from the former general rate to the intermediate rate. Several former 35% ad valorem rates were reduced to 30%, including those covering tires, hose, mats and matting, rubber clothing, raincoats (not less than 50 cents each) and rubberized fabrics. New tariff rates on other items show 2½% reductions, as follows, the rate shown being the new one: rubber belting, 25%; rubber boots and shoes, 22½%; hard rubber tubes for making fountain pens, and blanks for making combs, 7½%. Some other reductions included rubber thread, from 15% to 10%; canvas rubber-soled shoes, from 40% to 35%; rubber goods not specified, from 27½% to 22½%. Reclaimed and scrap rubber were not affected by the agreement, both materials entering Canada duty free.

Although in recent years rubber products imported into Canada, especially footwear, have increased from Japan, Hong Kong, and the Straits Settlements, the United States still surpasses all other countries combined, including the United Kingdom, as a source of Canadian imports of rubber products as a total.

Despite the fact that so many Canadian rubber factories are controlled by American interests, Canada has always been an important market for American exports of rubber products. Many of the products exported are in the nature of semi-finished manufactures such as reclaimed rubber, certain rubberized fabrics, and hard rubber items. Others are in the nature of novelties and specialties in which the Canadian industry is not competitive.

U. S. RUBBER PURCHASES FIRESTONE FOOTWEAR CO.

The complete plant and inventory of the Firestone Footwear Company, wholly-owned subsidiary of the Firestone Tire & Rubber Company, located at Hudson, Massachusetts, was purchased by the United States Rubber Company, through its subsidiary, the United States Rubber Products, Inc., last month, for a price reputed to be approximately $3,000,000. The purchase was effective as of November 18.

The purchasing company took over all of the existing contracts and accounts receivable and, according to present plans, will continue to operate the Hudson factory fulfilling all current orders as well as future requirements.

In an official announcement to its customers, the Firestone Footwear Company stated that "we wish to express our deep appreciation of the fine business relationship we have had with you, and we recommend to you the continuance of business relations with our successors, for whose products and policies we have the highest regard. The United States Rubber Products, Inc., will continue to carry complete stocks of merchandise and give service from the same locations. We shall appreciate your sending orders and remittances to same addresses as heretofore."

An indication that an important move with regard to the Firestone Hudson plant was in the air was indicated several months ago when Colonel Charles E. Speaks resigned as president of the Firestone Footwear Company as of October 1, after having been with the Firestone interests since 1913. In resigning Colonel Speaks stated that the "trying past ten-year period of the rubber industry has been largely due to mismanagement, particularly in the distribution and sales divisions." The Hudson factory produces canvas and rubber shoes and rubber heels.

Although from present indications U. S. Rubber will continue operation of the Hudson plant, it is believed in some quarters that eventually the business and machinery will be moved to Naugatuck, Connecticut. Consolidation of U. S. Rubber's footwear and allied line manufacturing at Naugatuck has been in progress for several years.

Close Henderson Rubber Plant

The future of the Henderson Tire & Rubber Company, of Bucyrus, Ohio, is in doubt. Directors of the company are holding a series of meetings to determine whether the factory, which was closed down on October 19, should be reopened or whether some other action should be taken. The company's difficulties are said to have been caused by the non-payment of approximately one-third of the $50,000 stock subscribed when the plant was opened last year by the present management. Reports from Bucyrus state that the factory will probably continue in operation shortly.

Another General Atlas Pamphlet

The latest pamphlet in the series currently being distributed by the General Atlas Carbon Company, New York City, combining humor with facts concerning Gastex, is devoted to rubber insulating cables. The cover depicts Perry's fleet at Lake Erie in 1813 when the American hero advised his superiors: "We have met the enemy and they are ours." Copy refers to the absence of rubber insulated cables when Perry defeated the British fleet, and adds that there isn't a single vessel afloat today which doesn't depend on them.

Rubber — and Circus Parades

The resumption of the old-time circus parade on the main streets of the nation is being made possible by the adaptation of rubber tires on circus wagons and rubber shoes on the horses. Parades featuring horse-drawn wagons have been frowned upon by city officials because the iron shoes and steel-rimmed wheels cut into asphalt streets. The adoption of rubber tires on wagon wheels and rubber shoes on the horses, therefore, obliterates this objection and the old-time circus parade will soon be with us again.

KELLY-SPRINGFIELD CO. GRANTED NEW TAX TRIAL

Climaxing a fifteen year old legal battle, the Kelly-Springfield Tire Company, Cumberland, Maryland, won a new trial on November 14 for an amortization deduction of $5,557,859 which it expended for war-time facilities on its $14,000,000 factory.

By a vote of 2 to 1, the Federal Circuit Court of Appeals, at Philadelphia, reversed a prior ruling of the Federal District Court of New Jersey, which had rejected Kelly-Springfield's claim. After this rejection, the case was sent back to the lower court for a new trial to grant the plaintiff a "reasonable" deduction, although the amount was not specified by the district judges.

In addition to granting a new trial, the Circuit Court also reinstated Kelly-Springfield's claim for a refund of $1,927,241 on its 1918 income taxes. The court held that if eventually a full amortization allowance is granted the company, then it should also be allowed the 1918 income tax rebate.

Muehlstein in Akron Deal

A deal was recently consummated between H. Muehlstein & Company, New York City, and H. C. France & Company, Akron real estate brokerage firm, involving the sale of a two-story brick building situated on four acres of land fronting Jewett and Nieman Streets. The purchase price was said to be $40,000. The building was until recently in the hand of the First-Central Trust Company as liquidators. The Muehlstein concern has purchased the plant in order to increase production and storage facilities in Akron where it has maintained an office for many years. Henry M. Rose is the Akron representative for the scrap and crude rubber dealers.

Urges Excise Tax Increase

J. W. Whitehead, president, Norwalk Tire & Rubber Company, Norwalk, Conn., recently addressed a letter to senators and representatives urging an increase in tire excise taxes. He cited the fact that technological improvement has resulted in fewer man-hours of labor being required for production maintenance by large manufacturers, also pointing out that there are approximately one-tenth the number of tire makers in existence today as there were a decade ago. Because of this situation, Mr. Whitehead urged congressmen to increase tire excise taxes, instituting "exemptions to apply to small and large manufacturers alike, similar to that now in effect in tax on individual incomes."

BOSTON RUBBER GROUP HOLDS FALL MEETING

Approximately 100 members and guests attended the annual Fall meeting of the Boston Group, Rubber Division, A.C.S., held at the University Club, in Boston, Massachusetts, on Tuesday evening, November 19. In addition to the regular dinner the meeting featured the election of officers for the 1936 term.

Immediately after the regular business report was presented by Secretary-Treasurer W. J. R. Hauser, of Heveatex, ballots were distributed for election purposes. On the first ballot Dr. John T. Blake, of the Simplex Wire & Cable Company, was chosen as chairman, while Dr. Royce J. Noble, consulting chemist of Malden, Mass., was named secretary-treasurer.

Following the election, the guest speaker, Colonel Walter C. Baker, C.W.S., was introduced. Colonel Baker, Chemical Officer of the 1st Corps Area, U. S. A., selected as his topic "Developments in Chemical Warfare." He discussed the many advancements made by the Government in the design and manufacture of chemical war materials, stressing the progress made in their applications in case of war.

Considerable research work is being conducted at the Edgewood Arsenal, according to the speaker, on the chemical, mechanical, and physical principles of materials used in both defensive and offensive tactics. He outlined briefly the required characteristics of such materials. Colonel Baker used lantern slides throughout his address. The meeting was presided over by retiring chairman J. J. Sindler, of the Converse Rubber Company.

Calcutta Factory for Dunlop

Following a series of interviews between representatives of the Dunlop Rubber Company, Birmingham, England, and officials of the Government of India, Dunlop has purchased the plant and property of the American Manufacturing Company located on the Hooghly River about 25 miles north of Calcutta. Machinery for the manufacture of tires, tennis balls, mechanical rubber goods, and other rubber products, is being rapidly installed for early production efforts. Purchase price for the complete factory buildings, residences, etc., is believed to have been approximately $1,000,000 although the Dunlop investment is expected to approximate $2,500,000 by the time machinery and equipment are installed. It is not known whether Dunlop secured any concession with regard to a higher protective tariff which its representatives sought from Indian governmental officials.

Enlarging Columbia Factory

Plans calling for the expenditure of $1,250,000 for changes and additions to the Columbia Alkali Corporation's factory in Barberton, Ohio, have been approved, with construction scheduled to start immediately. Principal purpose for the enlargement of the factory is for the manufacture of chlorine. According to report, chlorine will be a by-product in the manufacture of caustic soda under a different process than that now used. The addition of chlorine to the company's products marks its entrance into a new field. The appropriation brought to $8,250,000 the total sum authorized for improvements of factories owned and controlled by the Pittsburgh Plate Glass Company in 1935.

MURRAY RUBBER PLANT SOLD AT PUBLIC AUCTION

The plant and assets of the Murray Rubber Company, Trenton, N. J., were sold at public auction on December 6 to Max Kalter, of New York City, with the sale conducted by Judge Philip Forman. Kalter's bid was $340,000, topping a bid of $300,000 made by C. H. Greyer, of Trenton.

Several interested parties attempted to secure an adjournment of the sale, including counsel representing a group of creditors. After Greyer had submitted his $300,000 bid, his attorney withdrew it following protests that he (Greyer) was acting as a "straw man" for certain officials of the company. Creditors' counsel immediately requested a two-week postponment of the sale, but Judge Forman decided to dispose of the property at once. In addition to this request, counsel for the Third National Bank, of Scranton, which held a $700,000 claim against the company, and a receiver representing the National Bank, of Kentucky, which held $800,000 worth of claims, as well as a receiver of the Banco Kentucky Company, of Louisville, holding $585,000 in claims, also requested an adjournment to no avail.

The Murray Rubber Company, which the new owner intends to continue in operation at Trenton, is one of the oldest rubber firms in New Jersey. At one time it was known as the Empire Tire & Rubber Company, of which General C. Edward Murray, Sr., was head. Following General Edward's retirement, the company was taken over by a group of which his son, C. Edward Murray, Jr., was one. Several years ago the company discontinued the manufacture of mechanical rubber goods and devoted itself exclusively to the manufacture of tires and tubes. Entering financial difficulties a few years back, Alfred H. Branaham, of Louisville, Kentucky, was appointed receiver and remained up until the time of the public auction on December 6.

XMAS PARTY PLANNED FOR N. Y. RUBBER GROUP

One of the most interesting meetings yet to be held by the New York Rubber Group has been planned for the Annual Christmas Party which will be held on Friday, December 20, in the club rooms of the Building Trades Employers Association, at 2 Park Avenue, New York City.

Only one paper will be presented, i.e., "Technical Aspects of Submarine Cable," by F. S. Malm and A. R. Kemp, of the Bell Telephone Laboratories. The address will be highlighted by motion pictures, wired for sound and effects, portraying the actual laying of cables.

Two other entertainment features will be held in the form of a motion picture depicting a fight to the finish between a whale and a swordfish, and another film showing scenes taken by various amateur photographers at the outdoor frolic of the New York Group last June at Preakness, N. J.

Tickets for the Christmas Party are selling at $2.25 to members of the group, and $2.75 for non-members. The number of prizes to be awarded to holders of lucky numbers already assures one of the largest distributions ever made in this connection. The committee in charge of the program and prizes comprises C. R. Haynes, Binney and Smith Company, chairman; R. E. Casey, Naugatuck Chemical; J. Miscall, Flintkote Company; and Peter P. Pinto, business manager of THE RUBBER AGE.

In addition to the fun, election of officers will take place during the business session.

RECORD MEETING HELD BY R. I. RUBBER CLUB

Attracting a record-breaking attendance of approximately 150 members and guests, the Rhode Island Rubber Club held its annual Winter meeting on December 5, at the Narragansett Hotel, in Providence, R. I. L. D. Walker, president of the group, presided. As usual, a large number participated in the bowling tournament preceding the regular dinner, with Ray Newell, of Respro, Inc., capturing honors in the high three, and F. Fitzpatrick, also of Respro, winning the high single.

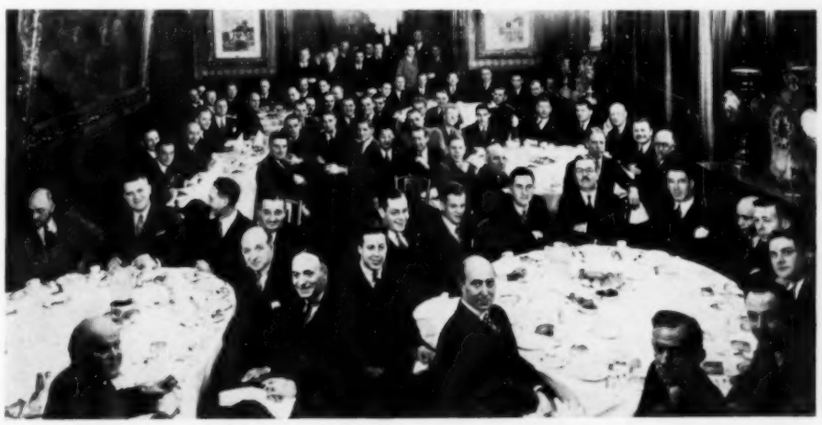
After the dinner, H. Walter Grote, of the United Carbon Company, entertained the group with his interesting feats of magic including several new sleight-of-hand tricks he learned during his recent European trip. Following Mr. Grote's display of necromancy, Dr. Ernst A. Hauser, widely known technologist, now Associate Professor of Industrial Chemistry at the Massachusetts Institute of Technology, discussed "My World Trip: 1934-35."

Considerably impressed with the progress of the Japanese rubber industry, Dr. Hauser confined most of his remarks to that subject, stating that Japan has jumped from sixth place in 1930 to within 2,000 tons of the United Kingdom in 1934, and expressing the belief that by the end of 1935 Japan will either equal that country in rubber consumption or will surpass it in total volume absorbed. Tracing, briefly, the history of Japan through the opening of its ports to foreign trade by Admiral Perry, the speaker said that in his opinion the poor quality of most Japanese products was due to the fact that its industries are relatively new and kinks have not yet been straightened out. Salaries paid to workers, however, although low, are in keeping with the standard of living.

Included among Dr. Hauser's remarks anent Japan were the following: all rubber imported is purchased by only three companies; the technical rubber equipment is of the latest type; on certain products its engineers have worked out automatic operations where other countries still use hand methods; as a rule all equipment installed is produced in Japan by Japanese workers; and the low manufacturing costs obtained in Japanese factories are due, in part, to the system of dealing in yens which is widely different from American and European systems of monetary control.

In concluding, Dr. Hauser stated that if Japan was allowed by other nations to develop China it would find a large outlet for its manufactures and therefore would partially eliminate itself from other world markets leaving these to the other nations of the world. Rubber factories in China, according to the speaker, are in very poor financial and mechanical condition.

H. WALTER GROTE



A group of familiar faces at the R. I. Rubber Club winter meeting.

Akron Group Has Meeting

The Akron Rubber Group held its first Winter meeting on Friday, December 6, at the Akron City Club. In addition to the usual dinner, the Group was addressed by A. L. "Bert" Ely, well-known patent attorney, on the subject, "Patents in the Rubber Industry." Mr. Ely is recognized as an outstanding authority on patent laws as they affect the rubber industry, and is also an accomplished after-dinner speaker. G. L. Allison, of Goodrich, is secretary of the Akron Group.

Safety Section Meeting Held

The Rubber Safety Section of the National Safety Council held a two-day meeting in Louisville, Kentucky, on October 15 and 16. The sessions featured several interesting papers delivered by prominent rubber safety men. A. M. Dietz, of the Pennsylvania Rubber Company, was vice-president in charge of all program activities. The officers for 1936 are expected to be announced shortly. J. Pohl, of Goodyear, was selected as editor of the Section's News Letter.

Financial News

FIRESTONE EARNINGS SHOW FAVORABLE GAIN

For the fiscal year ended October 31, 1935, Firestone Tire & Rubber Company, Akron, reports a net profit after depreciation, interest, Federal taxes, and other charges, of $5,649,146. Net profit reported for the previous year was $4,154,655, after similar deductions.

After dividend requirements on Series A, 6% cumulative preferred stock, the 1935 profit was equal to $1.53 a share on 1,866,007 shares of $10-par common stock, as compared with 71 cents a share on 1,897,594 common shares in the previous year. Net sales for the period amounted to $121,670,572, a gain of 22% over the 1934 net sales of $99,130,243.

Current assets on October 31, 1935, were $66,743,787, including $11,613,287 in cash. Current liabilities were listed at $19,610,234. In comparison with the previous report, current assets have increased while current liabilities have also increased by approximately the same amount. Inventories were $35,995,720 at the end of the current fiscal year, against $36,326,223 in the previous period.

In a note accompanying the report, Harvey S. Firestone, chairman of the board, advised stockholders that price cutting and "an unsound hazard guarantee which was imposed upon the industry by the distributors of special brand tires" had cost the company millions of dollars. He also stated that the Firestone Liberian rubber plantations would soon prove their value.

The report also revealed that Firestone has added approximately 400 new mechanical goods items to its line, making this division one of the most important departments, and that the company had entered into a contract with a leading Swiss firm which has erected a factory in Switzerland for the production and sale of Firestone products. Additions were added to the Firestone factories in England and Argentina, according to the report.

Raybestos Profits Gain

Raybestos-Manhattan, Inc., Passaic, N. J., earned a net income of $1,108,902 for the nine months of 1935 ending September 30, equal to $1.75 per share, as compared with net income of $892,838, or $1.39 per share in the same period of the previous year. The book value of 635,200 shares of Raybestos-Manhattan stock outstanding, after deducting 40,812 shares held in the treasury, was $23.95 per share, while the net current assets represented $11.45 per share of which cash and marketable securities amounted to $4.16 per share. A dividend of 25 cents per share, payable December 14, 1935, to stockholders of record on November 29, was also declared by the directors.

Goodrich Financially Active

B. F. Goodrich Company, Akron, has been involved in several financial deals of late. On November 15 it filed an amendment with the Securities and Exchange Commission, at Washington, D. C., delaying the effective date of its registration application covering $28,000,000 4½% bonds to December 9, the first step in its reorganization program. Pursuant to this action, a rumor arose in financial districts that a change in the Goodrich directorate personnel was in the offing, although no confirmation could be had from any executive. Earlier in November, the Exchange Control Commission of Japan authorized the transfer to the United States of 2,088,000 yen to complete the transaction between Goodrich and the Yokohama Rubber Company, under which Goodrich withdraws from control of the Japanese rubber manufacturing concern. The terms of the deal call for the selling of the remaining shares owned by Goodrich to the Furukawa interest with which the Akron firm has been associated since 1917.

Columbian Carbon Profits

For the nine months ended September 30, 1935, the Columbian Carbon Company, New York City, reports net earnings of $2,127,768, after taxes, depreciation, minority interest, and other charges, which is equal to $3.95 a share on 537,681 shares outstanding. This compares with net earnings of $1,661,651, or $3.09 a share on 537,902 shares, in the same period of 1934.

Re-opening Reclaiming Plant

After being closed for almost four years, the plant of the Akron Rubber Reclaiming Company, on Norton Avenue, in Barberton, Ohio, will be reopened on January 2, 1936. According to the present plans the factory will produce reclaimed rubber for the Mid-West Rubber Reclaiming Company, of St. Louis, once a subsidiary of the Akron firm. R. R. Semler, associated with the St. Louis company, is supervising all activities in connection with preparing the Akron plant for resuming production, and has been appointed superintendent of it.

Loss for Norwalk Tire

Norwalk Tire & Rubber Company, Norwalk, Connecticut, reports a net loss after depreciation, taxes and other charges, of $49,918 for the year ended September 30, 1935. This compares with a net profit of $11,324, equal to $1.23 a share on 9,184 shares of $50-par 7% preferred stock, in the previous year.

Hood Rubber Calls Notes

Hood Rubber Company, Inc., Watertown, Massachusetts, has called for redemption on January 15, 1936, at par and accrued interest, the balance of its 10-year 5½% convertible notes due on October 15, 1936. There are about $789,000 of the notes outstanding.

Incorporate American Rubber

The American Rubber Products Company, which has been in active production for the past six months at 100 Beech Street, in Akron, was incorporated on November 8. Incorporators included Scott A. Belden, C. F. Schnee, both attorneys, and R. C. Myers. Mr. Myers is in charge of the firm's operations which include the manufacture of rubber mats, treads for running boards, etc. The company employs approximately 60 persons.

Receiver for Enterprise Co.

The scheduled sheriff's sale of the Enterprise Rubber Company, of Providence, Rhode Island, was indefinitely postponed when a group of creditors filed an involuntary petition of bankruptcy against the company last month, resulting in the appointment of David C. Adelman, a Providence attorney, as receiver, by the United States District Court. The creditors filing the bankruptcy petition were: the Davidson Rubber, the Purepac, and the Mariette Doll Manufacturing companies. Daniel Goldman and F. Kantor are the executive heads of the Enterprise Rubber Company.

GENERAL TIRE INTRODUCES MULTI-VANE TREAD

At a combination dinner and sales meeting for dealers in New York and surrounding states, held at the Hotel Commodore, in New York City, on November 21, the General Tire & Rubber Company, of Akron, introduced a new type of automobile tire termed "the safest tire ever built."

Designated as the General Dual 10, the new tire features a multi-vane tread. In contrast to the conventional tread design, the tread of the Dual 10 is made up of many thin rubber flutes, or vanes, running longitudinally around the tire. These thin rubber vanes, because of their flexibility, envelope, rather than resist, obstructions in the road surface.

As indicated by both still and motion pictures shown to members of the press at a special dinner given the same evening at the Hotel Commodore, which was presided over by William O'Neill, president, and Larry McQueen, sales manager, of General Tire, the thin rubber vanes, when brakes are applied hard in an emergency stop, form a serpentine pattern on the surface, each vane acting as a squeegee to wipe the moisture off a wet surface so that the adjacent vanes can cling to a substantially dry surface. This same action of the multi-vane tread forms a clinging non-skid tire surface on a dry pavement.

The General Dual-10

OCTOBER CONSUMPTION 13% ABOVE SEPTEMBER

Consumption of crude rubber by manufacturers in the United States for the month of October is estimated to be 42,436 long tons, which compares with 37,553 long tons for September, 1935. October consumption shows an increase of 13% above September this year and 35.8% above October a year ago, according to statistics released by the Rubber Manufacturers Association. Consumption for October, 1934, was reported to be 31,253 (revised) long tons.

Imports of crude rubber for October were reported to be 34,356 long tons, a decrease of less than 1% below the September figure of 34,569 long tons, and 2.7% under 35,298 long tons imported in October, 1934.

Total domestic stocks of crude rubber on hand October 31st are estimated at 317,850 long tons which compares with September 30th stocks of 326,236 long tons, and 362,571 long tons on hand October 31, 1934.

Crude rubber afloat to U. S. ports as of October 31st is estimated to be 49,913 long tons as compared with 43,413 long tons afloat on September 30th of this year and 38,247 long tons afloat on October 31st a year ago.

October reclaimed rubber consumption is estimated at 9,662 long tons; production, 11,926 long tons; and stocks on hand, October 31, 1935, 19,640 long tons.

SEPTEMBER SHIPMENTS SHOW 30.3% DECREASE

Shipments of pneumatic casings during the month of September, 1935, are estimated to be 3,303,333 units, a decrease of 30.3% below August of this year, although 3.8% above shipments made in September a year ago, according to statistics released by the Rubber Manufacturers Association.

Production of pneumatic casings for September is estimated to be 3,786,873 casings, a decrease of 5.2% below August of this year but an increase of 29% over September, 1934.

Pneumatic casings in the hands of manufacturers, September 30th, are estimated to be 8,287,825, an increase of 6.2% above stocks on hand August 31st this year but were 1.6% under stocks on hand September, 1934.

The actual figures are as follows:

PNEUMATIC CASINGS

	Shipments	*Production*	*Inventory*
Sept., 1935 ..	3,303,333	3,786,873	8,287,825
August, 1935	4,739,259	3,992,800	7,805,054
Sept., 1934 ..	3,182,903	2,935,958	8,418,906

Rubber Institute Proposed

A draft of a proposed law which would create a Federal Brazil Nut and Rubber Institute has been presented and is being considered by the Brazilian Chamber of Deputies. According to the draft, the institute would foster and sponsor operation and management of rubber plantations throughout the country and would assist producers in marketing their rubber. Many other forms of assistance would be offered to the producer, including the latest information on tapping, bud grafting, etc. It is also proposed to carry on a great deal of experimental work similar to that now being conducted by such organizations as the Rubber Growers Association of England, the Rubber Institute of Malaya, and others.

RUBBER TRADE ASSOCIATION ELECTS OFFICERS

ROBERT BADENHOP

HERMAN MUEHLSTEIN

The annual meeting of the Rubber Trade Association of New York, Inc., was held on November 14 at the offices of the Association, 95 Broad Street, in New York City. Five directors were reelected to serve for another year, these being R. Badenhop, W. E. Bruyn, D. D. Haldane, H. Muehlstein and D. A. Patterson. A. L. Grant and L. V. Keeler were also elected directors to round out the board of seven required members.

Immediately following election of the directors, the board held a meeting and selected the following slate of officers for the ensuing year: Robert Badenhop, president; Herman Muehlstein, vice-president; D. D. Haldane, treasurer. Mr. B. G. Davy was re-appointed secretary-manager.

The new president, Robert Badenhop, is founder and president of the Robert Badenhop Corporation, which celebrated its twenty-fifth anniversary in November of last year. Mr. Badenhop has been engaged in the crude rubber business for 33 years, having started his activities on Mincing Lane, London.

Herman Muehlstein, newly-elected vice-president, has been president of H. Muehlstein & Company, New York City, since its organization in 1911. Originally the company traded solely in waste rubber, but later expanded its activities to embrace a crude rubber department which has grown to be recognized as one of the leading sources of supply in this country. In addition to his Rubber Trade Association activities, Mr. Muehlstein is a director of the Clearing Department of the Commodity Exchange, Inc. He has also acted as chairman of the Scrap Rubber Division of the National Association of Waste Material Dealers.

Treasurer D. D. Haldane heads the firm of Douglas Haldane and Company, Inc., and has been an active member and director of the Rubber Trade Association for some time. Mr. Davy has acted as secretary manager for the past several years.

Inland Erects Welfare Building

Inland Manufacturing Company, a division of General Motors, which manufactures rubber running boards and steering wheels, has erected a new welfare building for its employes at a cost of approximately $38,000. The front portion of the building is devoted to the employment department where are contained files of employee records. The rear portion of the building is devoted to a dining room which accommodates 300 persons. Adjacent to the dining room is a library and reading room. According to Wallace Whittaker, Inland president, business is proceeding satisfactorily with 2,600 persons employed, the greatest number in the company's history.

Display "Rubber Age" Article

The Los Angeles Public Library is currently displaying an enlarged reproduced version of the first page of the article "Pearson Donates Rubber Library to Los Angeles Institution" which appeared in the October, 1935 issue of THE RUBBER AGE. The display is approximately 15 x 30 inches in dimension. Selected quotations from the article are also quoted underneath the enlargement. The display is located in the lobby of the library.

Safety Plaques Awarded

Safety plaques have been awarded in connection with the Rubber Section Safety Contest, sponsored by the National Safety Council, for the period from January 1 to June 30, 1935, to three plants of the U. S. Rubber Company, and also to Van Cleef Bros., Chicago. The Naugatuck Footwear plant received first prize in Group A (plants working average monthly man-hours of 400,001 and over), the Providence plant received second prize in Group B (125,001 to 400,000 average monthly man-hour exposure), and the Samson Tire plant, at Los Angeles, was awarded first prize in Group C and D (5,000 to 125,000 average monthly man-hour exposure). Van Cleef also won a first prize plaque in one of the groups.

Vultex Opens Canadian Plant

For the convenience of its Canadian customers, the Vultex Corporation of America, of Cambridge, Massachusetts, has opened a branch factory at St. Remi, in Napierville County, Quebec, Canada. The complete Vultex line of natural and processed latex will be manufactured and distributed from the new factory.

Names in the News

A. M. DIETZ, of the Pennsylvania Rubber Company, Jeannette, Pennsylvania, has been selected as General Chairman of the Rubber Section of the National Safety Council for 1936. He was in charge of program activities at the recent Louisville safety meeting.

T. G. GRAHAM, vice-president, B. F. Goodrich Company, Akron, was one of 36 Goodrich workers to receive a 10-Year Service Club pin last month.

FRANKLIN R. HOADLEY, vice-president, Farrel-Birmingham Company, Ansonia, Connecticut, has been elected a member of the executive council of the Open Shop Conference of Connecticut for a term expiring October 1, 1936.

H. J. SHUCK, manager, Merchandise Distribution and Export, of the Goodyear Wolverhampton (England) factory, was a visitor to the Akron home offices last month. He has been with Goodyear since 1927.

JOSEPH O. BAUER, associated with the Thermoid Rubber Company, Trenton, N. J., for more than twenty-five years, has severed his connection with that concern. He was at one time secretary of the old Thermoid company and has held various executive positions.

P. C. ANDERSON, advertising director, B. F. Goodrich Company, and J. H. BUNTING, advertising manager, Seiberling Rubber Company, both of Akron, are scheduled to address the class in advertising principles conducted by Akron University.

STEVE WARGO, formerly general foreman in the bag and bottle department of the Miller Rubber Company, has been named process engineer for all items made in the drug sundry division and molded goods department.

I. DROGIN, chief chemist, J. M. Huber, Inc., New York City, has returned from an extensive tour of Europe in the interests of the company. He visited many of the leading rubber factories on the Continent.

PAUL E. MCGOWAN, branch manager, Denman Tire & Rubber Company, Warren, Ohio, has been elected head of the Cortland (Ohio) Kiwanis Club. He takes office January 1st.

HARVEY C. GREER, of the Goodyear chemical staff, and WILLIAM I. BURT, of the Goodrich chemical division, both attended the annual reunion of Ohio State University's chemical engineering department held on the November 16th week-end as a part of the University's annual "homecoming."

GEORGE E. WERNER, tire department foreman, Seiberling Rubber Company, Akron, was the winner of a $10,000 sweepstake prize last month.

A. L. VILES, president and general manager of the Rubber Manufacturers Association, 444 Madison Avenue, New York City, delivered an address on rubber in the new automobiles over radio station WOR on November 8. The address was sponsored by the *New York Evening Journal*.

DR. H. F. PALMER, chief chemist, Xylos Rubber Company, Akron, was one of a group of speakers to address delegates attending the annual reunion of the chemical engineering department of Ohio State University held last month.

C. W. UFFORD, personnel director, Ohio Rubber Company, Willoughby, Ohio, delivered an informative talk on industrial economics and relationships at a meeting of the Willoughby Kiwanis Club last month.

Cincinnati Rubber Expands

A contract for an extension of its building used for covering paper mill press rolls as well as other types of rolls and for tank linings has been let by the Cincinnati Rubber Manufacturing Company, of Cincinnati, Ohio, to the Austin Company, of Cleveland. The new extension is to be 80 feet in length and 50 feet in width, complete with craneway. The extension, according to J. F. Joseph, president of Cincinnati Rubber, is necessary to take care of expanding business.

Ask Patent Case Rehearing

Both the United States Rubber Company and the Firestone Tire & Rubber Company have petitioned the Sixth Circuit Court of Appeals, at Cincinnati, for a rehearing of the alleged patent infringement suit brought by U. S. Rubber against Firestone and which the court decided in favor of the defendant last month. The basis of the rehearing petition is on the issue of four claims of the alleged infringement of one of the patents involving a reshaping device which the petitioners claim were overlooked in the maze of claims and patents involved. No decision as to the rehearing has been made by the court to date.

Propose Commercial Standard

The Webbing Manufacturers Institute has proposed a commercial standard for woven elastic fabrics for use in overalls (overall elastic webbing) to the National Bureau of Standards. The purpose of the standard is to establish definite requirements and methods of test for woven elastic fabrics for the guidance of producers, distributors and users. Two types of materials are involved in the proposal, i.e., close-weave cord edge, covered rubber, 5/8 to 2 inches in width, and twille weave, bare rubber, 3/4 to 2 inches in width. Full details are available from the National Bureau of Standards.

Liquidate St. Mungo Company

Complete liquidation of the St. Mungo Manufacturing Company, golf ball manufacturers, of Newark, N. J., has been announced by Jack Jolly, president of the concern. At the same time Mr. Jolly announced the establishment of a new company to be known as Colonel Golf Balls, Jack Jolly, with headquarters on the St. Mungo site at 872 Broadway, in Newark. The Colonel golf balls are made for distribution through A. G. Spalding & Bros. retail outlets.

Kane Scores Hole-in-One

Thomas E. Kane, sales engineer of the Textile Finishing Machinery Company, of Providence, Rhode Island, widely known in both the textile and rubber industries, is receiving congratulations from his host of friends on his golfing in a competitive match recently held at the Sharon Country Club, Sharon, Mass. In this match Mr. Kane reached the zenith of all golfers' hopes—a hole-in-one. It was scored on the eighth hole during the match.

Publishing Monthly Graphs

Another service has been added to those supplied by Commodity Exchange, Inc., 81 Broad Street, in New York City. It is in the form of a graphic supplement to its daily market reports on rubber, silk, tin and hides, and will be published monthly. A glance at these graphs reveals the highlights of the statistics of each commodity in a convenient and readily understandable form. A separate sheet is devoted to each commodity.

May Re-open Firestone Mills

Harvey S. Firestone, Sr., and a group of other Firestone officials were scheduled to visit Fall River, Massachusetts, last month, to discuss the possible re-opening of the Firestone cotton mills located in that city. Firestone is seeking a substantial tax reduction before attempting to open the mill which employs some 2,000 workers when in normal operation. The Fall River mill was closed down several months ago shortly after Firestone acquired the Manville-Jenckes mills at Gastonia, North Carolina.

TRENTON NEWS

Due to a disagreement over the payment of a bonus to a selected group of employes, considerable unrest was experienced at the plant of the Lambertville Rubber Company, Lambertville, N. J., recently. The making and finishing departments were involved in the controversy, with some 150 workers walking out. The matter was later adjusted with the management maintaining the position that it reserves the right to pay bonuses to whomsoever it chooses. Production continues at a lively pace.

William D. Gorey, for fourteen years a foreman for the Hamilton Rubber Manufacturing Company, Trenton, died on November 3, at the age of 63, following a lengthy illness. He had been associated with the rubber industry in New Jersey for some forty years. Burial was at Trenton.

The Luzerne Rubber Company, Trenton, is erecting an addition to its press room. The addition will be 60 x 94 feet in dimension, of brick and steel construction, and will include a 150-foot brick stack at a cost of $9,000.

The Puritan Rubber Company, Trenton, has let a contract for a warehouse at its plant on Perrine Avenue. It will cost $3,000.

John Evans, who retired eight years ago after forty years of service with the Thermoid Rubber Company, died at the age of 75 on November 17 at his Trenton home. He is survived by a widow and son.

EXECUTIVE DECLARES RESTRICTION A FAILURE

According to William de Krafft, chairman of the finance committee of the U. S. Rubber Company, the current restriction scheme is a failure because, in his opinion, it has aggravated causes of instability in the rubber industry rather than alleviating them as was intended.

Mr. de Krafft holds that the restriction scheme has resulted in higher prices which have magnified the output of native grown rubber, that it has raised production costs to a point where European owned-and-controlled estates cannot cover expenses, and that still higher prices will serve only to accentuate native overproduction and encourage the use of crude rubber substitutes. He visualizes two necessary steps to the basic problem, the first being a reduction in production costs on the European owned plantations, and, secondly, the development of new and varied uses for rubber.

In a statement distributed to members of the Rubber Manufacturers Association last month, Mr. de Krafft stated: "Restriction schemes seem at the outset to be quite simple but complications multiply rapidly and results which could not be foreseen create new problems which are increasingly hard to solve." One of these complications, according to the statement, was the cycle of circumstances including the under-estimate of the extent of native rubber trees in the Netherlands East Indies, together with a faulty appraisal of the effectiveness of regulating native growers in the Indies through taxation methods rather than through actual restriction of their output. Because of these many factors Mr. de Krafft holds the restriction scheme a failure.

International Latex Cited

A complaint against the International Latex Corporation of Rochester, N. Y., was filed on November 29 by the Federal Trade Commission. The FTC charged unfair competition in the sale of such products as bathing caps, pad shields, crib sheets and tobacco pouches, alleging that International Latex had advertised such products as being "made of purest latex (not rubber)," whereas, according to the complaint, "in truth and in fact the products are composed of material consisting essentially of rubber hydrocarbon."

Open Dunlop African Factory

The rubber factory recently erected at Durban (Natal), in the Union of South Africa, by the Dunlop Rubber Company, has been officially opened with the Prime Minister of the country participating in the opening ceremonies. It is reported that among other rubber goods to be produced at the new factory are Goodyear tires by special arrangement with the Akron, Ohio, company. With the exception of several key men from the Dunlop English plant, the South African factory has employed local help.

Goodyear Gets Hose Contract

The Goodyear Tire & Rubber Company, Akron, has been awarded an $11,320 contract for furnishing rubber hose for pneumatic equipment to the U. S. Navy. The hose is to be delivered to the Mare Island, Puget Sound and San Diego naval stations. Goodyear was the lowest of seven bidders.

Use Rubber Tobacco Pouch

A novel idea in merchandising tobacco has been introduced by the Axton-Fisher tobacco Company, Louisville, Kentucky, in connection with their Crumble Cut smoking tobacco. In place of the usual paper foil wrapping the company has substituted a thin rubber pouch. The tobacco is contained in an ordinary paper bag which fits into the rubber pouch. The pouch is wrapped twice around the inner package thus avoiding spillage. It is of green rubber, the complete ensemble retailing for ten cents.

Specimen of Axton-Fisher advertising.

Hold Rubber Problem Conference

A "Rubber Problem Conference" was held at the Hotel Highland in Springfield, Mass., early last month, by the Globe Rubber Works, Inc., of Boston. The conference was prepared by the engineering department of Raybestos-Manhattan, Inc., and was conducted by W. L. White, director of the Raybestos-Manhattan research laboratories. The importance of rubber in industry was indicated in a series of addresses made by Mr. White, Mr. Knowles, manager of Globe Rubber, and several members of the Globe selling division. The Globe Rubber Works has been distributing mechanical rubber goods in the New England market for a forty-year period.

Cabot in Sour Gas Deal

Deals for a large block of sour gas acreage in western Hutchinson County, Texas, were closed recently by Godfrey L. Cabot, Inc., in partnership arrangement with the Skelly Oil Company. The two concerns paid off on leases amounting to 9,638 acres, according to reports from the Panhandle Section. The deal calls for a drilling obligation for 14 wells to be completed in three years. The Cabot carbon black plant on the Armstrong Ranch is to be enlarged to 45,000,000 burning feet capacity.

Concession Granted Goodyear

The Costa Rican Congress on November 28 approved a contract with the Goodyear Tire & Rubber Company for the cultivation of 1,000 acres of rubber plantation. Special privileges for a fifteen year period were given Goodyear which, according to John Ingle, representative at San Jose, Costa Rica, will invest some $400,000 in the country. The concession obliges Goodyear to exclude diplomatic intervention in the event of any claims against the Costa Rican Government.

NATIONAL TIRE DEALERS HOLD 15th CONVENTION

The National Tire Dealers Association held its 15th annual convention on November 5, 6 and 7, at the Hotel New Yorker, in New York City, in connection with the annual automobile show.

At the opening session, the dealers assailed the rubber companies and the "lobby in Washington" for their treatment of independent dealers. President Erlinger stated that company-owned stores had "ruined" the battery and accessory business. In subsequent sessions the members adopted a resolution calling for a Congressional investigation of the rubber industry and one condemning the continuance of company-owned stores by Goodyear, Goodrich, Firestone, U. S. and General. Another resolution called for cooperation with the larger rubber companies to stabilize the retail industry.

On November 7, Senator A. Harry Moore, of New Jersey, addressed the delegates pledging himself to do everything possible at Washington to help the independent tire dealers' cause. At the closing business session Mr. Erlinger was re-elected president, George J. Burger was made secretary-treasurer, and J. J. Bradburn was selected as vice-president. The convention ended with a dinner and dance on Thursday evening, November 7.

Goodrich Awarded TVA Work

The B. F. Goodrich Company, Akron, on November 22, was awarded a contract for $7,940 worth of belting for use in connection with the Tennessee Valley project, at Knoxville, Tenn. The belting, according to C. H. Garity, T.V.A. director of purchases, will be used to carry crushed stone and sand from supply piles to a concrete mixing plant now under construction. Rubber belting is extensively used on the T.V.A. project for a number of various purposes, many of which were recently exhibited to the New York Rubber Group by Carl Zieme, technical superintendent of the Republic Rubber Company. Mr. Zieme secured special permission to take photographs of these special uses of rubber.

Huber Installs New Engine

Progress is reported in the plans for the installation of another large natural gas-driven engine in the power plant of the J. M. Huber Company, carbon black manufacturers. Supplied by the Meriam Company, of Cleveland, the new unit is the sixth purchased by Huber in the past four years.

Foxboro Acquires Atlantic Co.

The Foxboro Company, Foxboro, Mass. has acquired an interest in the Atlantic Precision Instrument Company, of Malden, Mass. The latter company manufactures the Verigraph, a device which determines and controls the thickness of dielectric materials, such as rubber, as well as performing other functions on other materials.

Using Rubber for Roads

The State Public Works Department of Massachusetts is using a new rubber compound, the result of extensive laboratory work, to join slabs of concrete on highways, both in new construction work and in road maintenance. The compound is used in liquid form, and is packed in seal drums.

OBITUARIES

Charles W. Sloan

Charles W. Sloan, former part owner and general manager of the Mercer Rubber Company, Hamilton Square, N. J., died on November 23 at his home in Ocean Grove. Death was due to a heart ailment. Eighty-eight years old at the time of his death, Mr. Sloan had been a resident of Trenton for many years. He was a graduate of the Princeton class of 1867. One of his first executive posts in the rubber industry was as manager for the Goodyear Tire & Rubber Company for several of its Eastern mills. In partnership with the late John Clancy, Mr. Sloan founded the Mercer Rubber Company, from which Mr. Clancy later resigned. Shortly thereafter Mr. Sloan sold his interests to Messrs. Sayen and Austin, the former being the father of William H. Sayen, current head of the Mercer concern. Burial was held in Flemington, N. J., where Mr. Sloan was born. He is survived by two nephews and two nieces.

William W. Whiting

William Wells Whiting, service manager of the Fisk Rubber Corporation, Chicopee Falls, Mass., died suddenly at his home in Springfield, Mass., on October 25th, at the age of 65. "Bill," as he was known to his associates at Fisk, served the company for 17 years, having started as branch manager in Philadelphia in 1904. He left the company in 1916, returning as service manager in 1928. Mr. Whiting was one of the pioneers in the rubber industry, having entered the business with the Chamberlain Rubber Company, Rochester, N. Y., in 1889. He also served with Goodyear, Diamond and Lee. In all he rounded out 46 eventful years in the rubber business. He had a host of friends in the industry who will mourn his passing.

Charles R. Griffith

Charles R. Griffith, former head of the B. F. Goodrich accounting department at Akron, died on November 26 while visiting friends in Canada. After serving Goodrich for twenty years Mr. Griffith retired in 1921 and had made his home in Pasadena, California, since that year. Funeral services were held on November 29 at St. Paul's Episcopal Church, at Akron. Burial was in Glendale Cemetery.

Gustave W. Steinfeldt

Gustave W. Steinfeldt, a member of the auditing department of the Goodyear Tire & Rubber Company for many years, died at the age of 54 on November 23 while visiting a friend's home in Akron. Death was attributed to a heart attack. He was a member of the Knights of Pythias, the Akron Liedertafel and the Church of Our Saviour. Funeral services were held at the Billow Chapel on November 25. Burial was in Milwaukee, Wisconsin.

George Cameron Stone

George Cameron Stone, internationally known metallurgist who was associated with the New Jersey Zinc Company from 1882 until his retirement in 1929, died at the New York Hospital in his 77th year, on November 18. He was a holder of eight important metallurgical patents, two of them covering the manufacture of sulfuric acid. A native of New York State, Mr. Cameron was also noted for his fine collection of ancient arms and armor. He was a member of several organizations including the Chemists Club. Funeral services were held at his home, 49 West Eleventh Street, New York City, on November 20. He is survived by a brother, nephew and niece.

NEW ENGLAND NEWS

The Naugatuck footwear plants recently received an army contract for 2,600 pairs of overshoes at $1.88 a pair, while Firestone Footwear (recently purchased by U. S. Rubber) was awarded 2,400 pairs at $1.83.

The Naugatuck factories of United States Rubber Products, Inc., have been awarded the bronze plaque of the National Safety Council for the best safety record among rubber factories during the first six months of 1935. The plants were closed down from November 27 to December 2, in line with the company's policy of permitting employes transferred from other cities to enjoy the holiday at their former homes.

Jenkins Bros., Bridgeport, Conn., has increased its personnel by 15 per cent as a result of a general business improvement which gives promise of heavy production for months to come, according to Bernard J. Lee, works manager. The company has presented to the City of Bridgeport a large fountain, located at State street and Fairfield avenue. It was dedicated November 14.

Exemptions and graduations on excise taxes which would not favor the larger manufacturers are advocated by James A. Walsh, president of the Armstrong Rubber Company, West Haven, Conn., who maintains that the present lack of flexibility in excise taxes handicaps the small producers. His plan is said to have strong support in some quarters and will be pushed aggressively at the next session of Congress.

Mr. Walsh cites the excise tax of 2½ cents a pound imposed on both large and small manufacturers in the automobile tire industry, saying that this is unfair because the large units have a marked advantage in purchases of raw materials and labor costs.

In 1914, he says, there were 600 tire manufacturers, as against 31 today. The number of persons thrown out of employment by this curtailment of units is estimated by Mr. Walsh at 200,000. He believes his plan of a graduated scale in excise taxes would encourage wider use of manpower per unit.

General Electric Company, which operates a large rubber department in its plant at Bridgeport, Conn., has announced termination of its company unemployment insurance fund, into which employes and the company have contributed more than $7,000,000 since 1930. The plan is being dispensed with because of the enactment of the Social Security Act. Disposition of the large fund which has accumulated will be determined by the vote of the employes.

LOS ANGELES NEWS

No November meeting of the California Rubber Manufacturers' Association was held but an enthusiastic meeting for December is planned by Charles N. Merralls, president.

The Sierra Rubber Company is the name of a new company organized by Henry Gabriel, Jr., Claus Vonder Reith, and Earl Weiss, with plant located at 2471 East 8th Street, Los Angeles. A general line of molded rubber mechanical specialties will be manufactured. The floor area is approximately 4,000 square feet. All three men were formerly connected with other rubber manufacturing plants in the city.

The December meeting of the Los Angeles Group, Rubber Division, American Chemical Society, will be held on December 20. Election of officers for the ensuing year will occur at that time. The main address of the evening will be given by Charles Lamb, vice-president of The West American Rubber Company, Inc., Los Angeles. Mr. Lamb has spent considerable time in Paris and elsewhere in study and his theme will be in the nature of a historical survey of the development of the rubber industry. A supper will be served to all members attending, the place of meeting to be selected by the general program committee. The plan of meeting in different places instead of a regular designated place has been adopted this year with the thought of arousing keener interest. A varied series of programs for the year has been tentatively planned.

At the November meeting of the group held at The University of Southern California, R. B. Stringfield, lecturer at the university, gave the principal address. The theme was, "Synthetic Rosins in Industry." Fifty members of the group were present and supper was served. The nominating committee to select a tentative group of officers for the ensuing year was appointed. R. E. Hutchinson, head of the chemical laboratories at the Firestone Tire and Rubber Company of California, presided.

The Kirkhill Rubber Company, 5801 S. Hoover Street, one of the largest manufacturers of rubber goods in Los Angeles, has added 5,000 square feet of storage space to its stock rooms and added several pieces of mechanical equipment to its plant. Kirk Hill, proprietor, states that business is good and constantly getting better.

The Los Angeles Rubber and Asbestos Works, 124 East Third Street, has completed a new fireproof factory building at 2031 East 51st Street. Machinery for the manufacture of mechanical rubber goods and asbestos insulation products has been installed with active production scheduled to begin on January 2. The building has more than 40,000 square feet of floor space and ceilings are of car height.

To operate the new factory another corporation has been formed known as the Los Angeles Rubber Manufacturing Company. Officers of the firm are the same as those of the Los Angeles Rubber and Asbestos Works, i.e., W. A. Corder, president; Walter Cox, vice-president; and S. K. Durfee, secretary. The parent firm has been in business since 1888. Its salesmen cover Southern California and Arizona. Mail order sales, however, put the company in the national class.

New Rubber Goods

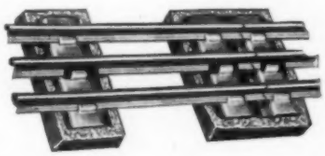
American "Happy Tot" Doll

A doll of unbreakable rubber which is described as being able to smile, pout and pucker up its lips, has been introduced by the American Character Doll Company, Inc., 200 Fifth Avenue, in New York City, under the name of "Happy Tot." When the head is turned to the left the doll "smiles." When the head is turned to the

right it "pouts" or "puckers." Happy Tot is available in both 10½ and 14½ inch sizes. It has dimpled cheeks, and is retailed with a diaper held in place with two safety pins for a realistic effect. It is washable. The American concern produces a complete line of dolls under the "Petite" trade name.

Conestoga Track Silencers

A non-skid track silencer for toy train tracks made of rubber to realistically represent the road-bed of full-sized railroad track is being merchandised by the Conestoga Corporation, Bethlehem, Penna. Its



most important feature, according to the manufacturer, is the holding of the sections of trackage together at the joints thus assuring continuity of electric contact at the joints. It is made of green sponge rubber, is adaptable to rearrangement of the track layout, and requires no nails with which to fasten the track to the floor or table. The track cannot slide out of place since the rubber pads cling to the surface. The non-skid track silencers prevent scratching or marring of surfaces and also serve to insulate tracks removing fire hazards caused by short circuits on nails, floor outlets, etc.

Goodrich Electro-Pak Battery

Featuring a stippled exterior design, an improved Electro-Pak automobile storage battery has been introduced by the B. F. Goodrich Company, Akron. By the use of 45 plates in the three cells instead of the usual 39, the new model is said to deliver 20% more power than similar batteries.

These plates are each ½ inch higher than ordinary types. Advantages of the new Electro-Pak claimed by Goodrich include: a power saving top cover which prevents acid spray from collecting on the terminals; patented vent caps which hold the top cover firmly in place; acid-seal cell covers, which are welded to terminal posts; and positive plate protectors said to prolong battery life.

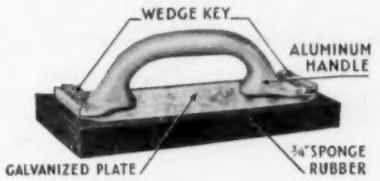
Converse Children's Boots

Converse Rubber Company, Malden, Massachusetts, has added two new children's boot models to its line. One of these, the Mickey Mouse Boot, is a bright finish boot with a red top band featuring Mickey and Minnie Mouse, Pluto and Donald Duck, all Walt Disney creations. It is made over a trim last with a warm fleece lining and can be worn with or without ski-pants. The second newly-added

model is the Saddle Boot, a perfect reproduction of a riding boot made of rubber in a rich tan shade. This boot is formed over a real riding boot that fits the leg and foot in a trim manner. It is 100% waterproof and has a fleece lining for warmth. This Saddle Boot is individually packed in cartons. Both new children's boots are said to be proving attractive items and are selling rapidly for the Christmas Holidays as gift items.

Atkins Sponge Rubber Trowel

Atkins Morfloat Trowel No. 1, a product of E. C. Atkins & Company, Indianapolis, Indiana, makes use of a sponge rubber base. It replaces the old-fashioned



floats made of carpet or felt. The trowel has an aluminum handle balanced to prevent cramping of the hand and wrist, wedge keys fastening the handle securely to galvanized plate. These wedge keys permit rapid replacement of the sponge rubber base, which has been designed to give the right density and porosity to produce a good sand finish. It can be quickly replaced at nominal cost completely assembled with galvanized plate.

Bassick Rubber Cushion Glide

A new style of rubber cushion glide for use on chairs, light tables, and other pieces of furniture used on hard surface floors, has been introduced by the Bassick Company, Bridgeport, Connecticut. The new type is constructed with pintle, or stem, to fit caster sockets and to be used where desired in replacing casters or in furniture where the legs are already

drilled with socket holes. Two sizes are available, having 1¼ and 1½ inch diameter bases. The rubber cushion is designed with annular rings for maximum resiliency. It has a hardened steel base adapted for use with standard size gripneck caster sockets.

Bondtru Flexible Coupling

A special rubber insert is utilized in the B-11 Bondtru (Junior) Flexible Insulated Coupling manufactured by the Charles Bond Company, 617 Arch Street, in Philadelphia. In larger sizes, ranging from 1 7/16 to 12 inches in outside diameter, leather or a cork composition insert is used. The Junior coupling comes in standard bores from ¼ to 9/16 inch. The rubber inserts are furnished in either soft or hard rubber, depending on the use to

which the coupling is to be put. The two flanges are die cast of a special alloy which resists corrosion. The illustration depicts the Junior coupling in unassembled form to show construction.

MARKETS

RUBBER—COTTON AND FABRICS—CHEMICALS

NEW YORK, DECEMBER 9, 1935

Crude Rubber

CRUDE rubber prices moved irregularly in mid-November due to renewed uncertainty with regard to the restriction scheme, reports filtering through that the Dutch were insisting on an increased quota, together with increased difficulties in controlling native rubber output. A big factory demand for actual rubber in the latter part of the month resulted in an upward price for spot on the Exchange for several days, with the price reacting upon disturbing reports regarding gold bloc currencies, together with early December liquidations. On December 3 price for spot broke 50 points upon the news that the International Rubber Regulation Committee, meeting in London, had granted an increase of 57,000 tons additional for 1936 to the Netherlands East Indies, dropping from a 13.18 quotation for spot on December 2 to 12.68. The demand for actual rubber since that date, however, has resulted in an upward price movement. Quotations in the outside market, Exchange, London, and Singapore, follow:

As of December 9

Plantations—			
Ribbed Smoked Sheets—			
No. 1, Spot	—	@	.13
April-June	—	@	.13 7/16
No. 2	—	@	.12 7/8
No. 3	—	@	.12 3/4
No. 4	—	@	.12 1/2
Thin Latex Crepe	—	@	.13 3/8
Thick Latex Crepe	—	@	.13 1/4
Brown Crepe, No. 1	—	@	.12 7/8
Brown Crepe, No. 2	—	@	.12 1/2
Amber Crepe, No. 2	—	@	.12 7/8
Amber Crepe, No. 3	—	@	.12 1/2
Amber Crepe, No. 4	—	@	.12 1/8
Brown Crepe, Rolled	—	@	.12 7/16
Latex—			
Liquid Latex, per gal.	.51	@	.52
Paras—			
Up-River, fine	—	@	.13 1/2
Acre Bolivian, fine	—	@	.13 3/4
Balata—			
Block, Ciudad	—	@	.32

LONDON MARKET

Standard Smoked Sheets—Buyers—December 9

December	—	@	6 7/16d
Jan.-March	—	@	6 3/8d

SINGAPORE MARKET

Standard Smoked Sheets—Sellers—December 9

December	—	@	6 3/8d
Jan.-March	—	@	6 1/4d

Reclaimed Rubber

With the exception of a slight lull last month, business activity on reclaims continues on an improved scale. Reclaimers view 1936 with confidence based on an optimistic view toward general improved conditions in industry as a whole. Current levels are still attractive for future deliveries. There has been no change in quotations since our last report.

High Tensile			
Super-reclaim, black lb.	.08 3/4	@	.09
High Tensile Red lb.	.07	@	.07 3/4
Shoe			
Unwashed lb.	.06 1/2	@	.06 3/4
Washed lb.	.08	@	.09
Tube			
No. 1 (Floating) lb.	.13	@	—
No. 2 (Compounded) lb.	.07 1/2	@	.07 3/4
Tires			
Black lb.	.05	@	.05 1/4
Black, selected tires lb.	.05 1/4	@	.05 1/2
Dark Gray lb.	.06 1/4	@	.06 1/2
White lb.	.09 1/4	@	.09 1/2
Truck, Heavy Gravity lb.	.05 1/2	@	.06
Truck, Light Gravity lb.	.06	@	.06 1/4
Miscellaneous			
Mechanical blends lb.	.04 1/4	@	.04 1/2

Scrap Rubber

Reclaimers' demands for scrap rubber continue active, with supplies showing signs of tapering off resulting in a slight rise in scrap rubber prices. Dealers view the coming year with confidence. Current quotations follow:

(Prices to Consumers)

Auto tire peelings ton	17.50	@	19.00
Mixed auto ton	7.50	@	8.50
Clean solid truck tires ton	32.50	@	35.00
Boot and shoes ton	20.00	@	21.50
Arctics, untrimmed ton	16.00	@	17.50
Inner tubes, No. 1 lb.	.07 1/2	@	.08
Inner tubes, No. 2 lb.	.03 3/4	@	.03 1/2
Inner tubes, Red lb.	.03 1/4	@	.03 3/8

Cotton

Since our last report cotton prices climbed steadily upwards until early this month, with a 12.45 high quoted on November 21. Low for the period was a 12-cent quotation on November 12 and 13. The price rise was temporarily halted late in November by rumors of pool selling in futures. Reaction from the high reached on November 21 to lower levels was due to reports that the 1936 acreage program would soon be announced by the AAA, which was expected to show a further reduction in crops. Because of this uncertainty the price fell despite favorable selling conditions. Early in December the price again wavered irregularly, dropping to 12.05 today (December 9) with the trade awaiting the result of the Hoosac Mills case pending before the Supreme Court on the matter of paying processing taxes. Cotton spinning, however, continues to expand throughout the world. Quotations for middling uplands on the New York Cotton Exchange follow:

	November 9	December 9		
	Close	High	Low	Close
December	11.39	11.78	11.60	11.63
March (1936)	11.25	11.58	11.38	11.41
May	11.25	11.52	11.31	11.34

Tire Fabrics

(Prices Net at the Mill—Process Tax Included)

Peeler, carded, 23/5/3 lb.	.34 1/4	@	.34 1/2
Peeler, carded, 23/4/3 lb.	.35 1/4	@	.35 1/2
Peeler, carded, 15/3/3 lb.	.32 1/4	@	.32 1/2
Peeler, carded, 13/3/3 lb.	.31 1/4	@	.31 1/2
Egyptian, carded, 23/5/3 lb.	.47 1/2	@	.47 3/4
Egyptian, combed, 23/5/3 lb.	.52 1/2	@	.52 3/4
CHAFERS			
Carded, American, 1 1/16" lb.	.34 1/2	@	.35
Carded, American, 1" lb.	.31	@	.34
LENO BREAKER			
Carded, American, 1 1/16" lb.	.34 1/2	@	.35 1/2
Carded, American, 1" lb.	.32 1/2	@	.33 1/2

Sheetings

Count	Width	Weight			
48x40	36 in.	5.50 lb.	—	@	.05 7/8
40x40	36 in.	6.15 lb.	—	@	.05 1/4
40x36	36 in.	6.50 lb.	—	@	.05
48x48	40 in.	2.50 lb.	—	@	.11
48x48	40 in.	2.85 lb.	—	@	.10
56x40	40 in.	3.60 lb.	—	@	.09
48x44	40 in.	3.75 lb.	—	@	.08
44x40	40 in.	4.25 lb.	—	@	.07 1/8

Ducks

Enameling lb.	.32	@	.36
Belting and Hose lb.	.32	@	—
Single filling, A grade lb.	.16 1/2	@	—
Double filling lb.	.17 1/2	@	—

Closing Rubber Prices on New York Commodity Exchange, Inc.

No. 1 Standard Contract of 10 tons

FROM NOVEMBER 10 TO DECEMBER 9

Date	Spot	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Sales
Nov. 10															
11															
12	13.18	13.13	13.21	13.29	13.37	13.45	13.53	13.61	13.68	13.75	13.81	13.88	13.94		190
13	13.18	13.14	13.22	13.29	13.37	13.45	13.53	13.61	13.67	13.73	13.80	13.87	13.94		351
14	13.31	13.32	13.40	13.48	13.55	13.63	13.70	13.77	13.85	13.94	14.00	13.07	14.14		283
15	13.21	13.21	13.28	13.37	13.45	13.53	13.60	13.67	13.73	13.80	13.86	13.93	13.99		426
16	13.09	13.09	13.16	13.24	13.31	13.39	13.47	13.55	13.62	13.70	13.78	13.86	13.93		177
17															
18	12.95	12.94	13.00	13.07	13.15	13.24	13.31	13.39	13.45	13.52	13.58	13.65	13.71		312
19	13.00	12.96	13.02	13.10	13.19	13.27	13.35	13.43	13.49	13.56	13.62	13.69	13.75		362
20	12.90	12.86	12.91	13.00	13.09	13.19	13.26	13.34	13.40	13.46	13.53	13.61	13.67		643
21	12.93	12.90	12.95	13.05	13.13	13.21	13.29	13.37	13.44	13.51	13.58	13.65	13.72		451
22	13.00	12.98	13.03	13.13	13.22	13.31	13.39	13.46	13.53	13.59	13.66	13.73	13.80		450
23	13.06	13.00	13.05	13.15	13.25	13.35	13.41	13.48	13.54	13.61	13.67	13.74	13.81		81
24															
25	13.00	12.95	13.00	13.09	13.18	13.27	13.34	13.42	13.48	13.55	13.61	13.68	13.75		183
26	13.00	——	13.00	13.09	13.18	13.28	13.35	13.42	13.49	13.56	13.62	13.69	13.76		437
27	13.12	——	13.11	13.20	13.29	13.39	13.46	13.54	13.61	13.68	13.74	13.81	13.88		776
28															
29	13.18	——	13.19	13.28	13.35	13.43	13.50	13.58	13.67	13.74	13.81	13.88	13.96		239
30	13.22	——	13.21	13.28	13.35	13.43	13.50	13.58	13.66	13.75	13.82	13.89	13.96		80
Dec. 1															
2	13.18	——	13.17	13.20	13.29	13.39	13.46	13.51	13.60	13.67	13.75	13.82	13.89	13.96	177
3	12.68	——	12.73	12.80	12.89	12.99	13.05	13.12	13.19	13.27	13.34	13.41	13.48	13.55	402
4	12.87	——	12.90	12.98	13.07	13.16	13.23	13.31	13.38	13.45	13.52	13.59	13.66	13.73	141
5	13.00	——	12.98	13.06	13.15	13.25	13.33	13.41	13.47	13.54	13.61	13.68	13.75	13.82	140
6	13.12	——	13.13	13.21	13.29	13.37	13.44	13.51	13.59	13.67	13.72	13.78	13.85	13.92	156
7	13.12	——	13.04	13.12	13.22	13.32	13.39	13.46	13.52	13.58	13.64	13.71	13.78	13.85	68
8															
9	13.00	——	12.98	13.06	13.16	13.26	13.34	13.41	13.49	13.56	13.62	13.69	13.76	13.83	202

Rubber CHEMICAL Markets

NEW YORK, DECEMBER 12, 1935

[All Quotations F.O.B. Works Unless Otherwise Noted]

ACCELERATORS

Organic			
A-1 (Thiocarbanilid)	lb.	.21 @	.25
A-5-10	lb.	.33 @	.36
A-7	lb.	.53 @	.65
A-11	lb.	.60 @	.75
A-16	lb.	.55 @	.65
A-19	lb.	.56 @	.75
A-32	lb.	.70 @	.80
A-17	lb.	— @	—
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	— @	—
Captax	lb.		
Crylene	lb.	.55 @	.65
paste	lb.	.45 @	.55
Di-Ortho-Tolyguanidine	lb.	.44 @	.47
Diphenylguanidine	lb.	.35 @	.37
Ethylidene aniline	lb.	.45 @	.47½
Formaldenyde aniline	lb.	.37½ @	.42
Guantal	lb.	.42 @	.51
Heptene	lb.	.40 @	—
Hexamethylene-tetramine	lb.	.37 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.11 @	—
Lithex	lb.	.18 @	.20
Methylenedianiline	lb.	.36 @	.37
Monex	lb.	3.25 @	—
Oxynone	lb.	.68 @	.80
Phenex	lb.	.50 @	.55
Pipsolene	lb.	3.55 @	4.00
R & H 40	lb.	.40 @	.41
R & H 50	lb.	.40 @	.41
R-2	lb.	1.55 @	1.90
Safex	lb.	1.20 @	1.25
SPDX	lb.	.75 @	—
Super-Sulphur No. 1	lb.		
No. 2	lb.		
Thiocarbanilid, drums	lb.	.21 @	.25
Trimene	lb.	.75 @	—
base	lb.	1.20 @	—
Triphenylguanidine	lb.	.58 @	.60
Tuads	lb.		
Ureka	lb.	.62 @	1.00
Ureka B	lb.	— @	—
Ureka C	lb.	.58 @	.69
Vulcanex	lb.		
Vulcone	lb.		
Vulcanol	lb.		
Z-88-P	lb.	.48 @	.60
Zimate	lb.		
Inorganic			
Litharge, domestic	lb.	.06½ @	—
Magnesia, calcined, heavy	ton	60.00 @	65.00

COLORS

Blacks (See Compounding Materials)

Blues			
Prussian	lb.	.37 @	.39
Ultramarine	lb.	.12 @	.14
Browns			
Sienna, Italian	lb.	.06 @	'13
Umber, Turkey	lb	.04 @	.04½
Greens			
Chrome, light	lb.	.20 @	.30
medium	lb.	.21 @	.31
Chromium Oxide, bbl.	lb.	.22 @	.23
Guignet's Green	lb.	.75 @	—
Reds			
Antimony			
crimson, 15/17	lb.	.48 @	—
sulfur, free	lb.	.48 @	.60
Indian English	lb.	.09 @	.10
Domestic (Maroon)	lb.	.11 @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red, f.o.b Easton	lb.	.09½ @	—
Whites			
Cryptone CB, No. 21	lb.	.06 @	.06¼
Cryptone, No. 19	lb.	.06 @	.06¼
Cryptone, ZS-20	lb.	.10½ @	.10¾
Cryptone, ZS-86	lb.	.10½ @	.10¾
Lithopone			
Albalith, black label—11 lb.		.04½ @	.04¾
Azolith	lb.	.04½ @	.04¾
Rayox	lb.		
Titanium oxide	lb.	.17 @	.19
Titanox B	lb.	.06 @	.06½
Titanox C	lb.	.06 @	.06½
Zinc Oxide—American Process			
American Azo			
ZZZ (lead free)	lb.	.05 @	.05¼
ZZ (leaded)	lb.	.04⅞ @	.05⅛
Anaconda, lead free	lb.	.05 @	.05¼
Horsehead Lead Free Brand			
Special—3	lb.	.05 @	.05¼
XX Red—4	lb.	.05 @	.05¼
XX Red—72	lb.	.05 @	.05¼
XX Red—78		.05 @	.05¼
XX Red—103	lb.	.05 @	.05¼
U. S. P.—X, bbls.	lb.	.08 @	.08¼
Kadox, black label—15	lb.	.05 @	.05¼
Blue label—16	lb.	.05 @	.05¼
Red label—17	lb.	.05 @	.05¼
St. Joe, black label	lb.	.05 @	.05¼
green label	lb.	.05 @	.05¼
red label	lb.	.05 @	.05¼
Zinc Oxide—French Process			
Florence White seal—7 bbls.	lb.	— @	.06¾
Green seal—8	lb.	.06 @	.06¾
Red seal—9	lb.	.05½ @	.05¾
Yellows			
Chrome	lb.	.15 @	.16
Ocher, dom. med.	lb.	.02¾ @	—

BLACKS

Arrow "Aerfloted" Specification	lb.	.0535@	.0825
Bone, powdered	lb.	.05½ @	.12½
Carbon, compressed	lb.	.0535@	.0825
uncompressed	lb.	.0535@	.0825
"Certified," Cabot	lb.	.0535@	.0825
Spherons	lb.	.0535@	.0825
"Disperso"	lb.	.0535@	.0825
Drop, bbls.	lb.	.05½ @	.14
"Excello," compressed	lb.	.0535@	.0825
"Fumonex"	lb.	.03 @	.07
"Gastex"	lb.	.03 @	.07
Lampblack	lb.	.07 @	.12
"Micronex"	lb.	.0535@	.0825
"Supreme"	lb.	.0535@	.0825
Thermatomic—"P 33"	lb.	— @	—
"Thermax"	lb.	— @	—
United "Dixie" & "Kosmos"	lb.	.0535@	.0825

COMPOUNDING MATERIALS

Aluminum Flake	ton.	21.85 @	24.50
Ammonia carbonate, lump	lb.	.10½ @	.12
Asbestine	ton	14.00 @	15.00
Barium carbonate (98-100%)	ton	56.50 @	61.50
Barium Dust	lb.	.05 @	.06
Barytes	ton	22.00 @	24.00
Basofor	lb.	.04½ @	—
Bentonite	lb.	.02 @	.03
Blanc fixe dry f.o.b. works	ton	70.00 @	75.00
Calcene	ton	35.00 @	43.00
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white, extra lt.	ton	45.40 @	60.00
heavy	ton	45.00 @	55.00
Clay, Kaolin, domestic	ton	7.50 @	15.00
Aerfloted, Suprex	ton	8.50 @	10.00
Congaree	ton	9.00 @	—
Dixie	ton		
Dixie, Jr.	ton		
McNamee	ton		
Par	ton		
Tensulite		15.00 @	—
Witco	ton	8.50 @	9.00
Cotton Flock	lb.	.10½ @	.18
Glues, extra white	lb.	.28 @	.30
medium white	lb.	.14 @	.19
Kalite No. 1	ton	30.00 @	55.00
Kalite No. 3	ton	40.00 @	65.00
Magnesium carbonate	lb.	.08 @	—
Mica	ton	65.00 @	80.00
Pyrax A	ton	— @	—
Rottenstone (powdered)	lb.	.02½ @	.05
Soapstone, powdered	ton	16.00 @	22.00
Starch, powdered	cwt.	3.56 @	3.76
Talc, domestic	ton	12.00 @	15.00
Whiting, commercial	ton	17.00 @	18.00
Columbia Filler	ton	9.00 @	14.00
English Cliffstone	ton	33.00 @	43.00
Sussex	ton		
Witco	ton	15.00 @	—
Wood Flour	ton	18.00 @	30.00
Zinc Carbonate	lb.	.10½ @	.11
Zinc Stearate	lb.	.26 @	—

MINERAL RUBBER

Black Diamond	ton	27.00 @	—
Genasco, solid (factory)	ton	25.00 @	27.00
Hard Hydrocarbon	ton		
Parmr, solid	ton	25.00 @	28.00
Pioneer, MR, solid	ton		
Pioneer-granulated	ton		

SPECIALTIES

Aromatics—Rodo	lb.		
Para-Dors No. 5145	lb.	2.00 @	—
Sunproof	lb.	.35 @	.37½
Sponge Paste	lb.	— @	.80
Tonox	lb.	.56 @	.60

SOFTENERS

Acids			
Acetic, 28%, bbls.	100 lb.	2.45 @	2.70
glacial, USP, bbls.	100 lb.	14.00 @	—
Nitric, 36 degrees	cwt.	5.00 @	6.00
Sulfuric, 66 degrees	ton	15.50 @	16.50
Acids, Fatty			
Laurex	lb.	.15 @	.16
Stearex	lb.	.08½ @	.13
Stearic, double pressed	lb.	.09 @	.14
Stearite	lb.	.08 @	—
Alkalies			
Caustic Soda, 76%	cwt.	3.60 @	3.75
Soda Ash, 58% C.L.	cwt.	2.52 @	—

Oils			
Corn, refined, bbls.	lb.	.12½ @	—
Cottonseed, crude	gal.	.093 @	.10
Cycline Oil	gal.	.15 @	.28
Degras (c.l. 100 bbls.)	lb.	.02¾ @	—
Less c.l. (10-25 bbls.)	lb.	.03 @	—
Lots less than 10 bbls.	lb.	.03¾ @	—
Fluxrite	lb.	.05½ @	.06½
Palm Lagos	lb.	.05 @	—
Niger	lb.	.04¾ @	—
Para-Flux	gal.	.17 @	—
Petrolatum, light	lb.	.02 @	.02½
Pigmentaroil, tank cars	gal.	.16 @	—
in drums	gal.	.22 @	.23½
Pine, steam distilled	gal.	.64 @	.65
dest. dist., drums	gal.	.40 @	.45
Rosin Oil, cmpd.	gal.	.40 @	—
Rubtack	lb.	.40 @	—
Seedine, c.l.	lb.	.07¾ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	.05 @	—
Witco Softener (f.o.b. wks.)	gal.	.15 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Wobonite, c.l.	lb.	.05 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.07 @	.08
coal tar	gal.	.07½ @	.08
hardwood	ton	25.00 @	30.00
pine, 200 lb. gr. wt.	bbl.	6.50 @	—
Rosin, grade K, 280 lb.	bbl.	5.55 @	—
Pigmentar, tank cars	gal.	.19 @	—
in drums	gal.	.25 @	.27
R. S. L. Resin	lb.	— @	—
Retort Pine Tar, drums.	bbl.	12.00 @	13.00
Solvents			
Acetone, pure	lb.	.12½ @	.13½
Alcohol, denatured, methanol, No. 1 bbls.	gal.	.29½ @	—
Benzene, 90%	gal.	.15 @	.24
Beta-Trichlorethane	gal.	— @	—
Bondogen	lb.	— @	—
Carbon, bisulfide	lb.	.05½ @	.06
Carbon, tetrachloride	lb.	.05 @	.05¾
Dichlorethylene	lb.	.29 @	—
Dipentene, cml., drums	gal.	.41 @	.44
Dryolene (f.o.b. Okla.)	gal.	.10 @	.10½
Ethylene dichloride	lb.	.05½ @	.06½
Gasoline, steel bbls.	gal.	.16 @	—
Naphtha, solvent	gal.	.26 @	.31
Plastogen	lb.		
Reogen	lb.		
Rub-Sol (f.o.b. Okla.)	gal.	.09 @	—
Trichlorethylene	lb.	— @	.09½
Turpentine, spirits	gal.	.46½ @	.50½
dest. dist., drums	gal.	.45 @	.48
Waxes			
Beeswax, white	lb.	.40 @	.41
Carnauba, yellow	lb.	.39 @	.40
Ceresin, white, dom.	lb.	.08 @	.11
Montan, crude	lb.	.10 @	.11
Paraffin (c.l.—f.o.b. N. Y.)			
Yellow crude scale	lb.	.02 @	.02½
White crude scale 124/126	lb.	.02 @	.02⅛
Refined, 125/127	lb.	.03¾ @	.04

ANTI-OXIDANTS

AgeRite, Gel	lb.		
HP	lb.		
Powder	lb.		
Resin	lb.		
White	lb.		
Albasan	lb.	.70 @	.75
Antox	lb.		
B-L-E	lb.	.57 @	.60
Flectol-H	lb.	— @	—
Flectol White	lb.	— @	—
Flectol B	lb.	— @	—
Neozone	lb.		
Oxynone	lb.	.66 @	.90
Retardex	lb.	.35 @	.40
Stabilite	lb.	.57 @	.62
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.55 @	.60

MOLD LUBRICANTS

Aresklene	lb.	— @	—
Cocoa Soapstock	lb.	.06 @	.08
Dipex	lb.	.06 @	.08
Laurex	lb.	.24 @	.30
Rusco, f.o.b. Nitro	lb.	.12 @	.30
Sericite, f.o.b. N. Y.	ton	65.00 @	—
Soap Tree Bark, cut, sifted	lb.	.06 @	.08
Zip (Mold Wash)	lb.	— @	—

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.23 @	—
Black	lb.	.08½ @	—
White	lb.	.08 @	.12
Brown	lb.	.07 @	.11½
Duphax	lb.	.09½ @	—

VULCANIZING INGREDIENTS

Sulfur Chloride, yellow (drs.)	lb.	.03½ @	.04
Sulfur flour.			
Refined, 100% pure (bags)	cwt.	3.45 @	—
Commercial (bags)	cwt.	1.95 @	2.80
Tellov	lb.		
Vandex	lb.		

Crude Rubber
Latex and Guayule
Reclaimed Rubber
Tires and Tubes

STATISTICS OF THE INDUSTRY

Rim Production
Automobiles
Gasoline
Cotton Prices

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1922	301,076	101,843,188	15.10	4,809	1,921,828	17.84	296,267
1923	309,144	185,060,304	26.72	8,772	5,672,319	28.87	300,372
1924	328,056	174,231,331	23.71	10,309	6,057,637	26.23	317,747
1925	396,642	429,705,014	48.36	14,827	19,847,753	59.76	381,815
1926	413,338	505,817,807	54.63	17,671	22,470,583	56.77	395,667
1927	426,258	339,874,774	35.60	27,775	24,735,488	39.76	398,483
1928	439,731	244,854,973	25.03	32,159	18,128,361	25.17	407,572
1929	560,084	239,178,783	19.15	36,485	16,868,733	20.64	523,599
1930	482,082	139,134,330	12.89	30,205	9,316,205	13.77	451,877
1931	497,138	72,918,949	6.54	25,595	4,255,472	7.42	471,543
1932	409,584	31,936,459	3.47	20,929	2,015,612	4.30	388,655
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	427,280
1934	449,322	97,898,519	9.73	23,848	5,770,109	11.23	425,615
1933:							
Oct.	44,474	6,115,330	6.14	2,669	397,167	6.64	41,805
Nov.	40,582	5,850,714	6.44	2,188	333,631	6.81	38,394
Dec.	39,461	5,869,556	6.75	1,888	293,690	6.94	37,573
1934:							
Jan.	47,963	7,403,123	6.89	1,975	352,116	7.96	45,988
Feb.	34,335	5,262,711	6.84	2,133	476,232	9.97	32,202
Mar.	41,119	6,765,173	7.34	2,947	583,313	8.83	38,172
April	43,841	8,232,746	8.37	2,814	588,453	9.18	41,027
May	48,494	10,001,239	9.21	2,389	544,212	10.17	46,105
June*	47,289	10,747,464	10.14	2,012	501,499	11.33	45,277
July	41,443	9,670,617	10.41	2,366	660,199	13.99	39,077
August	31,531	7,873,690	11.15	1,393	400,433	12.83	30,138
Sept.	31,074	8,293,859	11.92	1,665	474,446	12.72	29,409
Oct.	28,318	8,203,447	12.93	2,058	620,754	13.46	26,260
Nov.	36,325	10,470,076	12.87	1,230	327,672	11.89	35,095
Dec.	17,590	4,974,374	12.62	866	240,780	12.46	16,724
1935:							
Jan.	39,675	10,852,308	12.21	977	278,229	12.72	38,698
Feb.	47,271	12,291,242	11.61	1,845	480,440	11.62	45,426
March	45,350	11,801,152	11.62	1,868	486,379	11.62	43,482
April	39,735	10,096,487	11.34	1,096	285,903	11.64	38,639
May	29,278	7,171,025	10.98	793	202,402	11.39	28,485
June	31,240	7,523,598	10.75	524	153,595	13.10	30,716
July	46,987	11,666,577	11.08	489	132,173	12.06	46,498
August	40,249	10,419,056	11.56	476	130,464	12.23	39,773
Sept.	34,659	8,637,048	11.12	468	120,438	11.48	34,191
Oct.	35,091	8,742,222	11.12	651	188,518	12.92	34,440

* Revised.

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule: Tons	Guayule: Dollars	Balata: Tons	Balata: Dollars	Jelutong: Tons	Jelutong: Dollars	Liquid Latex (1): Tons	Liquid Latex (1): Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,853	3,537,810
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,388	4,680,386
1927	5,018	2,674,957	582	447,246	7,785	2,448,657	1,116	876,077
1928	3,075	1,755,685	731	430,855	7,552	2,540,059	4,167	2,185,579
1929	1,231	545,175	728	566,964	8,203	2,458,136	3,728	1,787,997
1930	1,096	347,388	501	422,684	5,907	1,403,244	4,449	1,506,804
1931	—	—	1,208	411,692	5,777	1,019,010	4,650	884,355
1932	—	—	708	147,403	4,607	616,596	5,085	601,999
1933	—	—	1,658	2,261,869	5,989	944,895	11,085	1,833,671
1934	402	75,349	1,054	438,209	4,988	943,752	13,070	3,633,253
1934:								
Nov.	—	—	60	20,169	332	60,904	887	296,447
Dec.	—	—	6	2,458	192	31,947	581	184,588
1935:								
Jan.	—	—	81	34,687	448	80,097	848	287,583
Feb.	—	—	62	20,981	222	33,850	573	179,583
March	—	—	57	15,917	488	80,643	1,290	354,654
April	—	—	51	11,452	419	58,429	1,721	415,100
May	51	9,464	62	12,931	332	51,805	1,427	380,844
June	105	19,502	75	23,809	330	50,165	591	152,665
July	51	9,800	49	15,758	388	62,736	1,144	303,518
August	50	9,464	31	8,963	445	82,179	1,234	370,431
Sept.	18	3,245	29	6,090	1,682	407,418	1,048	291,652
Oct.	48	8,112	27	7,641	208	33,262	1,287	342,101

(1) Weight given in pounds of dry rubber contained in latex.

U. S. Consumption of Crude Rubber

(Rubber Manufacturers' Association statistics raised to 100 per cent—All figures in long tons)
(All Quantities in Long Tons)

	Figures on Monthly Basis: 1928	1929	1930	1931	1932	1933	1934	1935
Jan.	34,403	43,002	36,194	28,557	29,648	22,645*	39,284*	47,103
Feb.	33,702	41,594	33,302	28,797	31,821	21,392*	40,609	43,187
Mar.	35,688	44,730	35,540	32,788	29,505	17,483*	47,097	42,620
Apr.	32,772	47,521	39,686	33,321	27,518	25,928	44,853*	44,714
May	37,333	49,233	39,386	37,817	30,957	44,074	42,918*	41,568
June	37,676	43,227	34,195	37,916	41,475	50,743*	40,147*	36,623
July	37,407	41,526	29,508	31,397	29,976	49,614*	32,553*	36,384
Aug.	42,927	38,274	30,850	27,586	23,721	44,428*	33,216*	39,242
Sept.	39,882	34,707	25,515	23,638	23,847	35,281*	30,258*	37,553
Oct.	40,857	34,800	27,516	22,277	22,286	31,543*	31,253*	42,436
Nov.	37,461	27,659	23,691	22,943	23,231	28,831*	34,842	
Dec.	31,232	25,531	21,687	21,409	18,015	28,757*	36,662	
Tot.	441,340	469,804	375,980	348,986	332,000	400,719*	454,350*	

* Revised.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*	Year	Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1925	132,930	137,105	35.6	13,203	1930	157,967	153,497	40.8	22,004
1926	180,582	164,500	45.9	23,213	1931	133,351	124,126	33.9	19,257
1927	189,144	178,471	47.6	24,980	1932	75,608	77,504	23.4	16,354
1928	208,516	223,000	50.4	24,785	1933	99,560	81,602	19.9	20,746
1929	218,954	226,588	48.4	27,464	1934	110,010	100,597	22.3	23,079

	Figures on Monthly Basis: Production	Consumption: Tons	Consumption: % to Crude	Stocks*		Production	Consumption: Tons	Consumption: % to Crude	Stocks*
1934:									
Jan.	9,828	7,000	17.8a	24,263	July	9,446	8,175	25.1a	24,926
Feb.	9,504	7,646	18.8	23,356	Aug.	8,160	8,493	25.5	24,607
Mar.	11,479	9,683	20.6	25,113	Sept.	6,974	7,028	23.2	24,540
Apr.	10,185	9,387	20.9	22,033	Oct.	8,145	8,167	26.1	24,511
May	10,848	9,500	22.1	22,887	Nov.	7,268	7,775	22.3	23,999
June	10,820	9,459	23.5	23,664	Dec.	7,353	8,284	22.6	23,079
1935:									
Jan.	10,465	11,261	23.9	22,291	July	8,421	8,396	23.1	17,810
Feb.	10,072	9,374	23.3	22,989	Aug.	9,557	8,795	22.4	18,272
Mar.	10,549	9,741	22.9	20,637	Sept.	9,041	8,774	23.4	18,260
Apr.	10,315	10,466	23.4	18,716a	Oct.	11,926	9,662	22.8	19,640
May	10,223	9,938	23.9	18,541	Nov.	.....	.....	...	.....
June	8,590	8,710	23.8	17,932	Dec.	.....	.....	...	.....

* Stocks on hand at the end of month or year.
a Revised.

U. S. Consumption of Gasoline

(Bureau of Mines Statistics)
(In Thousands of Barrels of 42 Gallons)

	1933 *	1934 *	1935		1933 *	1934 *	1935
January	26,397	29,489	28,062	August	37,400	39,105	42,836*
February ..	23,320	25,310	26,432	September .	34,580	34,669	37,862
March	28,123	30,577	31,997	October	33,022	37,674	41,401
April	29,791	32,736	36,076	November .	30,312	34,998	
May	33,709	38,071	39,089	December .	28,572	30,581	
June	37,699	36,430	37,884				
July	34,087	37,466	41,203	Total	377,003	407,106	

* Revised on basis of final annual figures issued by Bureau of Mines.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1924	21,863,311	1928	24,247,282	1932	6,261,336
1925	26,001,664	1929	24,141,502	1933	8,713,962
1926	24,199,524	1930	17,364,096	1934	12,255,118
1927	19,700,003	1931	11,253,800	1935	.....

1935:		1935:		1935:	
January ...	1,868,723	May	1,561,434	September .	1,052,044
February ..	1,616,398	June	1,428,314	October ...	1,648,757
March	1,724,077	July	1,339,353	November	1,804,473
April	1,907,032	August	797,827	December ..	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Ave.
1933																																
August	7 3/16	7 3/16	8	7 3/16	7 3/16	—	—	7 3/16	7 3/16	7 3/16	7 3/16	—	—	7	7 3/16	6 11/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	—	7 3/16	7 3/16	7 3/16	—	7 3/16
September	7 3/16	7 3/16	7 3/16	8	7 3/16	7	6 3/4	6 3/16	6 11/16	7 1/16	6 15/16	6 15/16	6 15/16	7	7 3/16	7	7 3/16	7 3/16	6 11/16	7 3/16	7	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 1/16	7 3/16	8 1/16	—	7 3/16
October	7 3/16	7 3/16	8	8 1/16	7 3/16	7 1/8	6 3/4	6 3/16	6 11/16	7 1/16	6 15/16	6 15/16	6 15/16	7	7 3/16	7	7 3/16	7 3/16	6 11/16	7 3/16	7	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 1/16	7 3/16	8 1/16	—	7 3/16
November	7 1/8	7 3/16	8	8 1/16	7 3/16	7 1/8	6 3/4	6 3/16	6 11/16	7 1/16	6 15/16	6 15/16	6 15/16	7	7 3/16	7	7 3/16	7 3/16	6 11/16	7 3/16	7	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 3/16	7 1/16	7 3/16	8 1/16	—	7 3/16
December	9 1/16	9 1/16	—	9 1/16	9 1/16	8 11/16	9 1/16	8 15/16	8 15/16	—	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	9 1/16	8 15/16	8 15/16	8 11/16	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	8 15/16	9 1/16	9	—	8 15/16
1934																																
January	9	9	8 11/16	9	9	9	—	8 3/16	8 3/16	8 3/16	8 3/16	8 3/16	8 3/16	—	—	—	—	9 1/16	9 1/16	9 1/16	9 1/16	9 5/16	9 5/16	9 3/16	9 3/16	9 3/16	10 5/16	10	10 5/16	10 1/16	—	9 3/16
February	9 3/16	9 1/16	9 11/16	—	10 5/16	10 5/16	—	10 1/16	10 3/16	—	—	—	—	10 1/16	10 1/16	10 1/16	10 1/16	—	—	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	—	—	10 3/16
March	10 1/16	10 1/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 1/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16	10 3/16
April	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16
May	14 3/16	14 3/16	14 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	14 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16
June	13	14	—	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	13 15/16	13 15/16	13 15/16	14 3/16	13 3/16	13 3/16	13 3/16	13 3/16	14 3/16	14 3/16	14 3/16	14 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16
July	14 3/16	15	—	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16
August	14 3/16	14 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16
September	14 3/16	14 3/16	13 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16	15 3/16
October	14 3/16	14 3/16	13 3/16	14	13	13	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	14	13 3/16	13 3/16	13 3/16	14 3/16	13 3/16	13 3/16	13 3/16	13 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16	14 3/16
November	13 3/16	13 3/16	13	13	13	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	13 3/16	13	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16
December	—	—	12 3/16	13	13	13 3/16	13 3/16	13 3/16	13	—	12 3/16	12 3/16	12 3/16	12 3/16	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
1935																																
January	13 3/16	13 3/16	—	13 3/16	13 3/16	—	—	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	—	—	13	12 3/16	12 3/16	13 3/16	13	13 3/16	13 3/16	13 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	13 1/16
February	13 3/16	12 3/16	—	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12	12	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16
March	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12	12 3/16	12 3/16	12	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16
April	11 3/16	11 3/16	11 3/16	11 3/16	11	11	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16
May	11 3/16	11 3/16	12 3/16	12 3/16	12 3/16	12 3/16	11 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16
June	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16
July	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16
August	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16	12 3/16
September	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	12	12	11 3/16	12	12	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16	11 3/16
October	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16	12 1/16
November	11 3/16	11 3/16	11 3/16	12	12	13 3/16	13 3/16	13 3/16	13 3/16	12 3/16	12 3/16	12 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16
December	13 3/16	13 3/16	12 3/16	12 3/16	13	13 3/16	13 3/16	13 3/16	13	13	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16	13 3/16

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Market)

Average Price per Pound for Years 1910-1929

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1910	206.60	1914	65.33	1918	60.15	1922	17.50	1926	48.50
1911	141.30	1915	65.85	1919	48.70	1923	29.45	1927	37.72
1912	121.60	1916	72.50	1920	36.30	1924	26.20	1928	22.48
1913	82.04	1917	72.23	1921	16.36	1925	72.46	1929	20.55

Average Monthly Price per Pound Since 1928

	1929 Cents	1930 Cents	1931 Cents	1932 Cents	1933 Cents	1934 Cents	1935 Cents
Jan.	20.14	15.24	8.34	4.38	3.08	9.32	13.10
Feb.	23.7	15.85	7.70	4.03	2.95	10.45	12.92
Mar.	24.55	15.34	7.71	3.35	3.01	11.01	11.51
Apr.	21.18	14.93	6.43	3.02	3.56	12.10	11.55
May	21.46	14.24	6.49	3.09	4.95	13.26	12.05
June	20.64	12.45	6.35	2.66	6.15	13.51	12.57
July	21.30	11.24	6.37	2.89	8.01	14.60	12.10
Aug.	20.59	9.96	5.38	3.63	7.31	15.47	11.98
Sept.	20.37	8.28	5.08	3.84	7.30	15.36	11.55
Oct.	19.67	8.20	4.87	3.65	7.64	13.96	12.62
Nov.	16.62	9.01	4.65	3.44	8.66	13.04	13.15
Dec.	16.12	9.05	4.64	3.24	8.87	12.98	
Average for Year	20.55	11.98	6.17	3.49	5.96	12.92	

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	Sept.	Oct.	Nov.	Dec.	Day	Sept.	Oct.	Nov.	Dec.
1	—	5 11/16	6 5/16	—	17	5 3/16	6 1/4	—	
2	5 3/16	5 5/16	6 3/8	6 1/4	18	5 3/16	6 1/4	6 5/16	
3	5 3/8	5 11/16	—	6 5/16	19	5 1/16	6 1/4	6 5/16	
4	5 5/16	5 11/16	6 5/16	6 1/4	20	5 1/2	—	6 5/16	
5	5 1/2	5 11/16	6 3/8	6 5/16	21	5 1/16	6 1/4	6 5/16	
6	5 7/16	—	6 3/8	6 5/16	22	—	6 1/4	6 5/16	
7	5 1/16	5 11/16	6 5/16	6 5/16	23	5 1/16	6 3/8	6 5/16	
8	—	5 11/16	6 5/16	—	24	5 3/4	6 3/8	—	
9	5 1/2	5 11/16	6 3/8	6 5/16	25	5 11/16	6 3/8	6 1/4	
10	5 7/16	6	—		26	5 3/4	6 7/16	6 1/4	
11	5 1/2	6 1/16	6 5/16		27	5 11/16	—	6 5/16	
12	5 7/16	6 1/16	6 5/16		28	5 3/4	6 7/16	6 5/16	
13	5 3/8	—	6 5/16		29	—	6 3/8	6 5/16	
14	5 3/8	6 1/16	6 3/8		30	5 3/4	6 1/2	6 3/8	
15	—	6 1/16	6 3/8		31	—	6 3/8	—	
16	5 5/16	6 1/16	6 1/16						

Average Monthly Price Per Pound

Month	1932 Pence	1933 Pence	1934 Pence	1935 Pence	Month	1932 Pence	1933 Pence	1934 Pence	1935 Pence
Jan.	3.052	2.264	4.429	6.434	Aug.	2.654	3.811	7.401	5.696
Feb.	2.760	2.093	4.920	6.292	Sept.	2.485	3.728	7.409	5.508
Mar.	2.047	2.099	5.136	5.745	Oct.	2.425	3.957	6.806	6.130
Apr.	1.876	2.323	5.712	5.604	Nov.	2.518	4.096	6.294	6.308
May	1.825	2.966	6.207	5.822	Dec.	2.444	4.200	6.295	
June	1.750	3.392	6.245	6.027	Average for Year	2.434	3.233	6.159	
July	1.875	3.860	7.053	5.801					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	Oct.	Nov.	Dec.	Date	Oct.	Nov.	Dec.	Date	Oct.	Nov.	Dec.
1	11.05	11.40	—	11	11.20	—		21	11.15	12.45	
2	11.40	11.35	12.20	12	—	12.00		22	11.20	12.30	
3	11.30	—	12.35	13	—	12.00		23	11.40	12.25	
4	11.35	11.35	12.25	14	11.20	12.20		24	11.35	—	
5	11.35	—	12.20	15	11.25	12.35		25	11.30	12.25	
6	—	11.45	12.20	16	11.25	12.30		26	11.30	12.25	
7	11.40	11.55	12.20	17	11.15	—		27	—	12.25	
8	11.30	11.70	—	18	11.25	12.20		28	11.25	—	
9	11.30	11.80	12.05	19	11.20	12.20		29	11.35	12.20	
10	11.30	—		20	—	12.35		30	11.35	12.15	
								31	11.40	—	

Average Monthly Price Per Pound

	1932 Cents	1933 Cents	1934 Cents	1935 Cents		1932 Cents	1933 Cents	1934 Cents	1935 Cents
Jan.	6.65	6.23	11.25	12.70	Aug.	7.43	9.55	13.40	11.48
Feb.	6.85	6.05	12.28	12.58	Sept.	6.30	9.64	13.00	10.80
Mar.	6.86	6.39	12.30	11.63	Oct.	6.30	9.58	12.48	11.28
Apr.	6.16	7.02	11.80	11.73	Nov.	6.22	10.04	12.53	12.01
May	5.72	8.64	11.44	12.25	Dec.	6.00	10.17	12.76	
June	5.02	9.47	12.20	11.89	Average for Year	6.41	8.63	12.36	
July	5.87	10.76	12.84	12.26					

World Stocks of Crude Rubber

ON HAND OR AFLOAT TO THE U. S.

At End of	ON HAND 1933	ON HAND 1934	ON HAND 1935	AFLOAT 1933	AFLOAT 1934	AFLOAT 1935	ON HAND AND AFLOAT 1933	ON HAND AND AFLOAT 1934	ON HAND AND AFLOAT 1935
Jan.	396,376	368,660	346,084	32,539	45,768	42,066	428,915	414,428	388,150
Feb.	381,794	358,681*	339,335*	32,898	53,063	42,969	414,692	411,744*	382,304*
Mar.	390,135	352,897*	338,700	29,531	54,722	44,485	419,666	407,619*	383,185
Apr.	382,167	351,073*	334,954	30,745	56,251	37,651	412,912	407,324*	372,605
May	364,623	350,935*	319,281	43,342	57,921	44,375	407,965	409,250	363,656
June	333,954	358,461*	320,470	63,608	46,698	55,581	397,562	404,847	376,051
July	326,609	365,072	330,528	57,435	45,869	49,018	384,044	410,941	379,546
Aug.	325,148	363,711*	329,548	53,084	40,278	47,724	378,232	403,989*	377,272
Sept.	334,637	360,623*	326,236	57,255	38,831	43,413	391,982	399,454	369,649
Oct.	343,579	362,571*	317,850	58,568	38,247	49,913	402,147	400,818*	367,763
Nov.	353,852	361,236		57,140	38,625		410,992	399,861	
Dec.	364,541	352,632		55,606	47,644		419,147	400,276	

(Rubber Manufacturers' Association figures raised to 100%)

* Revised.

STOCKS IN GREAT BRITAIN

Stocks in London

(No. of Tons in Wharves and Warehouses, including Latex)

At end of	1933	1934	1935	At end of	1933	1934	1935
Jan.	36,481	38,570	81,807	July	41,178	50,490	99,226
Feb.	37,182	38,752	87,605	Aug.	39,480	48,953	101,574
Mar.	40,589	40,501	92,664	Sept.	39,237	56,103	101,198
Apr.	40,911	42,413	94,361	Oct.	37,101	63,079	94,749
May	41,998	42,190	95,722	Nov.	36,139	67,656	
June	43,032	45,674	98,077	Dec.	35,615	72,285	

At End of Recent Weeks

	First Saturday	Second Saturday	Third Saturday	Fourth Saturday	Fifth Saturday
1935					
July	98,302	98,784	97,934	98,342	
Aug.	98,950	99,423	100,533	99,860	100,972
Sept.	101,246	101,709	101,357	100,542	
Oct.	100,635	100,405	97,642	94,560	
Nov.	94,178	90,736	90,145	90,496	90,026

Stocks in Liverpool

1935					
July	74,211	74,527	74,250	74,766	
Aug.	74,948	75,778	75,752	75,503	75,733
Sept.	76,012	76,303	76,396	76,416	
Oct.	76,746	76,139	76,092	76,070	
Nov.	76,363	76,271	76,154	75,996	76,370

STOCKS IN PENANG AND SINGAPORE

(Stocks held by Dealers—Quantities in Long Tons)

End of	1932	1933	1934	1935	End of	1932	1933	1934	1935
Jan.	48,850	22,525	40,405	50,588	July	17,017	36,972	65,099	41,266
Feb.	46,954	21,530	41,884	51,628	Aug.	20,649	38,601	59,227	36,117
Mar.	46,591	24,594	47,933	46,046	Sep.	20,415	36,948	54,905	29,122
Apr.	39,663	25,460	48,431	43,295	Oct.	23,158	37,282	54,155	30,111
May	38,690	29,822	76,393	45,625	Nov.	25,419	39,018	49,282	
June	19,770	34,676	73,218	43,866	Dec.	25,341	38,269	51,255	

STOCKS IN OTHER CENTRES

	Malaya Mainland	Holland	Colombo	Para and Manaos
End of: 1934				
Dec.	23,173	1,326	5,732	3,293
Jan., 1935	33,609	1,397	5,926	3,477
Feb.	32,062	1,534	4,753	3,153
Mar.	31,844	1,551	3,917	3,214
Apr.	33,583	1,536	4,245	3,019
May	31,896	1,499	4,910	2,643
June	33,823	1,481	4,659	2,012
July	33,949	1,448	4,700	1,222
August	30,660	1,455	4,866	965
Sept.	29,986	1,442	4,402	1,004
Oct.	29,975	1,440		

RUBBER STOCKS AFLOAT

	Afloat for United States	Afloat for Europe	All Other * Afloat	Total * Afloat
End of: 1934				
July	45,869	35,430	15,355	96,654
August	40,278	36,060	21,001	97,349
September	38,831	39,630	35,215	113,716
October	38,247	40,560	20,061	98,868
November	38,625	39,870	21,342	99,837
December	47,644	41,200	36,132	124,976
End of: 1935				
January	42,066	35,600	35,334	113,000
February	42,969	28,750	31,281	103,000
March	44,485	30,400	17,115	92,000
April	37,651	31,400	29,949	99,000
May	44,375	30,300	29,325	104,000
June	55,581	27,485	17,934	101,000
July	49,018	29,150	17,832	96,000
August	47,724	32,800	21,476	102,000
September	43,413	32,000P	24,587	100,000
October	49,913	32,000P	18,087	100,000

* *Total Afloat* is an arbitrary estimate based on 1½ months' shipments as adopted by the Department of Commerce. *All Other Afloat* is determined by subtracting the amount of stocks in transit to the United States and Europe from the estimated total.

P—Preliminary estimate.

U. S. Tire and Tube Statistics[1]

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Figures for Recent Years

	1927	1928	1929	1930	1931	1932	1933	1934
Production	64,439	77,944	68,726	50,965	48,739	40,085	45,304	47,233
Shipments	64,059	74,296	69,395	53,638	48,151	40,260	44,094	46,687
Inventory[2]	10,264	13,624	11,838	9,003	7,775	7,644	8,888	9,455

Figures for Recent Months

	PRODUCTION 1933	PRODUCTION 1934	PRODUCTION 1935	SHIPMENTS 1933	SHIPMENTS 1934	SHIPMENTS 1935	INVENTORY 1933	INVENTORY 1934	INVENTORY 1935
Jan.	2,258	3,922	4,626	2,597	3,222	3,663	7,237	9,684	10,398
Feb.	2,339	4,335	4,383	2,292	3,285	3,287	7,377	10,725	11,530
Mar.	2,038	5,180	4,346	2,092	4,223	4,204	7,290	11,651	11,675
Apr.	3,123	4,470	4,512	3,654	4,438	5,144	6,778	11,981	11,003
May	5,189	4,456	4,175	5,180	5,332	4,067	6,760	11,127	11,131
June	6,100	4,342	3,910	6,305	5,228	4,262	6,615	10,219	10,755
July	5,714	3,353	3,532	5,497	4,157	5,447	6,844	9,437	8,850
Aug.	4,994	3,533	3,993	4,707	4,308	4,739	7,070	8,697	7,805
Sept.	3,999	2,936	3,787	3,503	3,183	3,303	7,595	8,419	8,288
Oct.	3,249	3,287		2,537	3,010		8,462	8,657	
Nov.	3,039	3,341		2,197	3,191		9,247	8,779	
Dec.	3,082	3,778		3,531	3,109		8,888	9,455	

AUTOMOBILE INNER TUBES

Figures for Recent Years

	1927	1928	1929	1930	1931	1932	1933	1934
Production	70,823	80,180	68,829	52,420	48,333	36,891	42,546	46,228
Shipments	72,896	77,127	70,592	54,938	50,021	37,911	41,391	45,046
Inventory[2]	13,692	16,117	12,807	9,999	7,922	6,749	7,815	9,180

Figures for Recent Months

	PRODUCTION 1933	PRODUCTION 1934	PRODUCTION 1935	SHIPMENTS 1933	SHIPMENTS 1934	SHIPMENTS 1935	INVENTORY 1933	INVENTORY 1934	INVENTORY 1935
Jan.	2,093	3,530	4,259	2,535	3,199	3,722	6,197	8,403	9,621
Feb.	2,224	4,077	4,171	2,102	3,323	3,362	6,357	8,445	10,466
Mar.	1,883	5,194	4,123	1,902	4,118	4,168	6,369	10,244	10,406
Apr.	2,853	4,735	4,259	3,051	4,342	4,453	6,189	10,585	10,170
May	5,189	4,359	3,892	5,180	4,902	3,451	6,760	10,043	10,615
June	5,448	4,097	3,480	5,778	5,309	4,024	6,097	8,795	10,050
July	5,603	3,531	3,251	5,211	4,323	5,269	6,440	8,053	8,005
Aug.	4,916	3,680	3,894	4,687	4,198	4,556	6,628	7,555	6,939
Sept.	3,827	3,110	4,125	3,472	3,024	3,426	7,008	7,639	7,565
Oct.	3,506	3,219		2,676	2,689		7,831	8,151	
Nov.	2,863	3,169		2,103	2,767		8,625	8,503	
Dec.	2,631	3,503		3,410	2,850		7,815	9,180	

(1) Rubber Manufacturers' Association figures, raised to 100%. The Association estimates its figures to be 75% complete up until 1929 and 80% complete for 1929-1933. Beginning 1934, the Association reported its figures to be 97% complete.

(2) Held by manufacturers at end of period indicated.

Automobile Production

	United States Total	United States Passenger Cars	United States Trucks	Canada Total	Canada Passenger Cars	Canada Trucks	Grand Total
1928	4,357,384	3,826,613	530,771	242,382	196,737	45,645	4,599,944
1929	5,358,420	4,587,400	771,020	263,295	207,498	55,797	5,621,715
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933*	1,920,057	1,573,512	346,545	65,924	53,855	12,069	1,992,126
1934	2,778,739	2,190,099	588,640	116,890	92,538	24,352	2,895,629
1934							
Oct.*	132,491	84,503	47,988	3,780	2,125	1,655	136,271
Nov.*	78,465	45,556	32,909	1,697	1,052	645	80,162
Dec.	183,187	128,059	55,128	2,732	2,334	398	185,919
1935							
Jan.*	292,817	229,233	63,584	10,607	8,269	2,338	303,424
Feb.*	335,699	275,623	60,076	18,114	13,885	4,229	353,813
March*	429,834	361,816	68,018	21,975	18,179	3,796	451,809
April*	477,746	401,628	76,118	24,121	20,686	3,435	501,867
May*	364,727	307,522	57,205	20,765	17,093	3,672	385,492
June*	361,321	296,609	64,712	15,745	12,276	3,469	377,066
July*	337,044	276,084	60,960	13,069	9,471	3,598	350,113
Aug.	240,051	182,389	57,662	7,692	5,524	2,168	247,743
Sept.	89,805	57,285	32,520	5,323	3,819	1,504	95,128
Oct.	275,021	214,609	60,412	8,313	7,128	1,185	283,334

* Revised.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA [1]							DUTCH EAST INDIES [2]						
	Gross Exports	Imports	Gross Exports Minus Imports	Ceylon [2]	India & Burma [3]	Sarawak [4]	British North Borneo [3]	Siam [4]	Java & Madura	Sumatra E. Coast	Other D.E.I.	Indo-China [5]	Amazon Valley	All Other [6]	World Total [7]
1923	252,816	70,432	181,584	39,971	6,416	5,705	4,237	1,718	32,930	46,344	57,822	5,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,657	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	65,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,530
1927	371,322	182,845	188,477	55,356	11,321	10,923	6,562	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1933	573,412	167,377	406,035	63,351	4,527	10,874	7,555	7,765	73,851	91,861	149,659	18,394	9,883	2,737	846,312
1933:															
Sept.	49,607	15,146	34,461	5,111	125	1,027	727	611	5,868	9,164	15,005	1,702	656	274	74,731
Oct.	61,002	17,390	43,612	5,674	271	959	750	979	6,329	8,682	15,170	1,426	965	314	85,131
Nov.	54,599	20,142	34,457	6,097	516	1,020	750	1,303	6,684	9,951	14,474	1,553	956	366	78,127
Dec.	57,579	18,110	39,469	7,435	964	989	750	1,046	7,030	10,183	17,274	3,779	930	302	90,151
1934:															
Jan.	55,055	16,128	38,927	6,929	1,531	1,197	805	1,290	6,513	7,975	13,913	1,109	576	127	80,892
Feb.	57,867	15,027	42,840	8,620	775	1,005	805	1,264	6,706	9,211	13,696	1,232	831	105	87,090
March	58,515	19,907	38,608	6,750	1,412	1,360	806	1,363	8,655	10,539	19,084	1,968	846	113	91,504
April	56,748	20,957	35,791	5,157	762	1,447	894	1,311	7,282	9,808	19,250	1,330	440	236	83,708
May	69,403	25,691	43,712	8,870	1,106	1,892	1,397	997	12,104	14,606	26,598	1,243	726	328	113,579
June	53,282	20,981	32,301	5,397	1,425	1,886	644	1,497	4,860	6,192	15,956	1,593	765	377	72,893
July	53,335	22,829	30,506	3,818	710	1,662	1,048	2,399	5,762	7,369	14,415	1,703	353	252	69,997
Aug.	52,641	17,865	34,776	4,948	552	1,714	1,048	1,908	5,340	8,901	11,356	1,610	710	251	73,114
Sept.	61,051	17,889	43,162	6,555	294	1,438	839	1,626	5,722	10,738	14,688	1,665	764	222	87,713
Oct.	47,045	10,226	36,819	6,544	413	1,412	1,196	1,328	5,970	6,643	5,556	1,413	840	401	68,535
Nov.	51,140	8,759	42,381	6,756	501	953	941	1,356	7,621	7,123	5,338	2,356	1,017	334	76,676
Dec.	59,575	15,375	44,200	8,481	990	1,237	680	2,043	10,865	12,953	12,354	2,956	1,035	239	98,033
1935															
Jan.	56,720	17,142	39,578	5,202	2,269	1,630	1,222	2,614	3,812	5,371	8,704	2,650	1,196	460	74,719
Feb.	50,593	17,676	32,917	5,556	731	1,887	760	2,288	4,395	7,663	15,194	2,076	636	254	74,154
Mar.	47,407	13,437	33,970	3,181	701	1,901	773	2,076	5,592	7,950	7,973	1,472	740	526	66,855
Apr.	53,360	16,029	37,331	2,976	370	1,895	846	1,661	5,574	6,873	12,683	2,827	963	185	74,957
May	51,353	23,720	27,633	4,223	674	2,323	848	2,752	6,217	7,931	21,058	2,138	832	315	76,920
June	49,751	18,637	31,114	3,525	1,077	2,031	603	2,869	5,698	8,258	14,168	2,021	659	393	72,416
July	48,975	11,257	37,718	4,106	580	1,870	1,164	1,939	5,899	5,664	8,373	2,015	427	407	70,162
Aug.	51,873	10,978	40,895	5,683	724	759	566	2,062	4,661	6,923	8,875	2,451	1,150	442	74,541
Sept.	51,247	10,418	40,829	3,970	681	1,797	421	2,278	4,089	5,862	9,422	2,248	1,121	300*	73,018
Oct.	48,258	19,364	28,894	5,932	1,150	2,168	1,040	2,622	3,937	6,698	16,432	2,748	1,000*	300*	

(1) Malayan net exports cannot be taken as production, since imported rubber is largely wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 115 tons in 1923, 1,117 in 1924, 3,618 in 1925, 3,263 in 1926, 2,439 in 1927, 1,437 in 1928, 2,670 in 1929, and 1,274 in 1930. (2) Ceylon Chamber of Commerce statistics until 1926; rubber exported as latex is not included—such shipments were equivalent to 18 tons in 1923, 93 tons in 1924, 6 tons in 1925, 20 tons in 1926, about ½ ton in 1927, and 1 ton in 1928, and practically none in 1929, 1930 and 1931. (3) Official statistics. (4) Imports into Singapore and Penang. (5) Exports from "Other D.E.I." are chiefly wet native rubber, which is reduced about one-third in weight by remilling; rubber exported as latex is not included which on a basis of 3½ pounds per gallon amounted to 2,342 tons in 1923, 1,008 tons in 1924, 2,239 tons in 1925, 44 tons in 1926, 84 tons in 1927, 1,459 tons in 1928, 1,302 tons in 1929, and 2,656 tons in 1930. (6) Calculated from official import statistics of principal consuming countries, viz., United States, United Kingdom, France, Germany, Belgium and Netherlands, and includes guayule rubber. (7) This total includes the third column for British Malaya, "Gross Exports minus Imports," and all the figures shown for the other territories. * Figure is provisional; final figure will be shown when available.

NOTE: THE FIGURES FOR 1933 ARE REVISED AS OF JANUARY 25, 1935 AND REPRESENT FINAL FIGURES

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	World Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,299	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,381	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,846	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	398,365	73,335	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,243	7,831	5,520	10,402	772,803
1934:															
Mar.	39,306	14,008	4,980	6,453	3,411	5,655	1,394	4,018	671	965	284	836	394	976	86,242
Apr.	42,262	9,999	3,210	6,701	2,419	5,679	1,966	1,326	415	504	262	1,217	752	465	77,177
May	47,412	9,786	3,634	6,499	2,218	6,905	2,218	4,360	769	214	322	940	142	1,768	87,192
June	46,785	16,564	3,803	6,171	2,208	6,745	1,887	3,145	1,512	837	331	843	1,146	1,624	93,601
July	40,308	12,266	4,051	5,494	2,430	5,739	708	1,640	732	810	540	1,602	747	1,094	78,161
Aug.	31,405	13,728	3,660	3,078	1,948	4,945	1,795	6,829	658	669	239	1,033	277	1,495	71,759
Sept.	30,345	11,254	4,244	2,607	2,770	7,346	1,486	4,487	743	501	339	980	465	477	68,044
Oct.	27,323	18,897	3,424	2,148	3,043	7,227	1,296	3,681	798	693	447	813	675	254	70,719
Nov.	35,982	15,875	3,176	3,425	1,568	5,580	1,744	4,488	516	379	187	1,382	542	215	75,079
Dec.	17,305	15,816	3,605	5,207	2,849	3,904	1,979	6,460	1,312	—168	139	1,143	615	762	60,928
1935															
Jan.	39,546	20,383	5,573	4,286	2,670	4,400	1,613	3,446	1,099	419	158	1,252	468	1,245	86,558
Feb.	45,999	15,609	4,593	3,513	1,558	5,582	4,356	1,810	848	399	477	838	567	1,836	87,985
Mar.	44,772	12,810	4,017	6,353	2,710	4,421	1,582	4,624	1,459	240	331	891	630	741	85,581
Apr.	40,061	11,574	3,306	5,820	1,063	6,635	1,653	3,387	1,150	520	329	1,049	432	789	78,115
May	29,962	12,498	3,828	6,049	3,929	5,429	935	1,937	671	982	272	853	815	774	68,934
June	31,410	10,253	3,210	4,551	1,435	3,373	1,831	3,087	496	1,065	446	780	745	604	66,286
July	47,694	9,454	3,247	4,929	1,319	4,484	1,298	1,823	520	572	157	800	548	185	77,030
Aug.	41,057	14,120	4,508	4,790	2,814	4,453	916	1,227	655	528	413	820		673	
Sept.	35,256	11,223	3,740	5,453	1,604	3,590	1,696	1,593	449	806	123			914	
Oct.	35,770	3,184													

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced 12 per cent in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1] United States imports of guayule are included in this compilation. * Figure is provisional; final figure will be shown immediately it becomes available.

A Section Devoted to Listings of Leading Producers and Distributors of Raw Materials, Machinery and Equipment, and Supplies for the Rubber Industry.

The Market Place

Chemicals and Compounding Materials — Machinery and Equipment—Crude, Reclaimed and Scrap Rubber—Fabrics—Rubber Products — Consulting Engineers.

Chemicals and Compounding Materials —

ACCELERATORS—
Ureka C—Ureka Blend B—Ureka.—A-1, A-7, A-11, A-16, A-19, A-32, Z-88, A-510, DPG
ANTIOXIDANTS — Flectol A, Oxynone
The RUBBER SERVICE Laboratories Co.
1012 Second National Bldg., Akron, Ohio
A Division of MONSANTO Chemical Wks.

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 25 years.*
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Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

ASBESTINE—Specially prepared for use in Rubber. Send for liberal working samples.
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International Pulp Co.
41 Park Row New York City

CADMIUM REDS
In 6 Shades . . Deep Orange to Extra Dark Red
LITHOPONES
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Newark, New Jersey
Branches in Principal Cities

CALCENE—The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
The Columbia Alkali Corporation
BARBERTON, OHIO

CARBON BLACK—*Micronex*
the world's standard gas black. universally known as the "King of Rubber Pigments."
Binney & Smith Co.
41 East 42nd St. New York City

IN this section are listed the products of the leading producers of materials and equipment used by rubber manufacturers.

When buyers refer to these pages for their needs, your name and address and a description of your products should be available here. The cost of a one-inch listing is only $5.00 per issue—the lowest cost of advertising space available in the rubber field.

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77 Franklin St. Boston, Mass.

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Arrow Black for rubber compounding. Standard for grit-free uniformity.
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460 West 34th St. New York

CARBON BLACK
SUPREME—*the up-to-date standard for rubber*
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Union Bank Bldg., Pittsburgh, Pa.

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

CARBON BLACK
DISPERSO . . . *the specially developed Carbon Black that gives* BETTER DISPERSION.
WISHNICK-TUMPEER, INC.
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CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.
Moore & Munger
33 Rector Street, New York City

CHEMICALS
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Antioxidants — *Oil of Myrbane* — *Latol*
Specialties — *Aniline Oil* — *Dispersions*
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Div. of U. S. Rubber Products, Inc.
1790 BROADWAY NEW YORK

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Fine organic colors—Reds, Blues, Oranges, Violets, Greens—or any shade to meet your requirements—also Rubber Dispersed Colors
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